DOCUMENT RESUME

ED 409 428 CE 074 347

TITLE	Agribusiness and Natural Resources Education. Vocational Education Program Courses Standards.
INSTITUTION	Florida State Dept. of Education, Tallahassee. Div. of Applied Tech., Adult, and Community Education.
PUB DATE	Jul 97
NOTE	478p.; Supersedes ED 358 265.
AVAILABLE FROM	Florida Department of Education, Product Distribution, Tallahassee, FL 32399 (order no. AG 483 BK 97).
PUB TYPE	Guides - Classroom - Teacher (052)
EDRS PRICE	EDRS Price MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	*Agribusiness; *Agricultural Education; Agricultural Engineering; Agricultural Machinery; Auto Mechanics; Behavioral Objectives; *Competency Based Education; Conservation Education; Curriculum; Employment Qualifications; Entry Workers; Environmental Education; Equipment Utilization; Evaluation Criteria; Forestry Occupations; Horticulture; Job Skills; *Natural Resources; Off Farm Agricultural Occupations; Postsecondary Education; Secondary Education; State Curriculum Guides; *State Standards; *Statewide Planning; Student Evaluation; Teaching Guides; Turf Management; Veterinary Assistants; Vocational Education; Zoos
IDENTIFIERS	*Florida

ABSTRACT

This document contains vocational education program course standards (curriculum frameworks and student performance standards) for exploratory courses, practical arts courses, and job preparatory programs offered at the secondary and postsecondary level as part of the agribusiness and natural resources education component of Florida's comprehensive vocational education program. Curriculum frameworks are provided for 27 programs/clusters: introduction to agriscience technology and environmental sciences; orientation to agriscience technology and environmental sciences; exploration of agriscience technology and environmental sciences; fundamentals of agriscience; agribusiness cooperative education-on-the-job training; agricultural business technology; agricultural education directed study; agricultural mechanics cluster (agricultural machinery mechanics, agricultural machinery operations, diversified agricultural mechanics); agricultural production technology; agricultural sales and services; agricultural technology; animal products processing; aquaculture; citrus production technology; crop and specialty plant production; environmental horticulture science and services cluster (floriculture, irrigation operations, landscape operations, nursery operations, sport and recreational turf operations); forest management; forestry and natural resources cluster; forest technology; golf course operations; landscape technology; ornamental horticulture technology; park management; pest control technology; turf equipment management; veterinary and animal science and services cluster; and zoo animal technology. Each curriculum framework includes some or all of the following: program title, occupational area, grade level, length, certification awarded; major concepts/content covered in the course; laboratory activities; special notes; and intended outcomes. (MN)

VOCATIONAL EDUCATION PROGRAM COURSES STANDARDS

July 1997

Agribusiness and Natural Resources Education

ED 409 428

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VOCATIONAL EDUCATION

PROGRAM COURSES STANDARDS

AGRIBUSINESS AND NATURAL RESOURCES EDUCATION

July 1997

FLORIDA DEPARTMENT OF EDUCATION
Division of Applied Technology, Adult and Community Education
Bureau of System Implementation and Technical Assistance
Tallahassee, Florida 32399

(904) 488-0406

FOREWORD

Section 228.041 Florida Statutes defines vocational education as meaning that instruction not necessarily leading to a baccalaureate degree, either graded or ungraded, listed below:

1. Job/preparatory programs designed to provide students with the minimum competencies necessary for effective entry into an occupation;

2. Exploratory courses designed to give students initial exposure to the skills and aptitudes associated with a broad range of occupations in order to assist them in making informed decisions regarding their future academic and occupational goals;

3. Supplemental programs designed to enable persons who are or have been employed in an occupation to upgrade their competencies in order to reenter or maintain employment or advance within their current occupation;

4. Practical arts courses designed to teach students practical generic skills which, though applicable to some occupations, are not designed to prepare students for entry into a specific occupation; or

5. Instruction which integrates the basic academic skills and vocational skills.

This document contains vocational education program courses standards (curriculum frameworks and students performance standards) for exploratory courses, practical arts courses and job preparatory programs offered at the secondary or postsecondary level as a part of Florida's comprehensive vocational education program. Vocational education program courses standards are established pursuant to section 239.205, Section 233.011, and Section 232.2454, Florida Statutes, for school districts and community colleges. State Board of Education Rule 6A-6.0571, Criteria for Qualification of Special Vocational-Technical Education Program Courses, provides the basis for the development and dissemination of this document.

Each program courses standard is composed of two parts: A curriculum frame work and student performance standards. The curriculum framework includes four major sections: major concepts/content, laboratory activities, special notes, and intended outcomes. Student performance standards are listed for each intended outcome.

The standards do not prescribe how instruction should be delivered since decisions relative to the delivery of instruction must be made by school districts and community colleges within the context of local conditions. The Division of Vocational, Adult and Community Education, Florida Department of Education, supports the belief that competency-based vocational education is the most effective means of providing programs and coursed that conform to these established standards.

Program and course standards are based upon competencies required for entry, advancement, and upgrading in occupations in the vocational program areas of Agriculture, Business, Diversified, Health Occupations, Home Economics, Technology, Industrial, Marketing, and Public Service Education. Standards for coursed designed for handicapped, disadvantaged, and other special needs persons are also provided. The standards are reviewed annually and revised as needed based upon changes in occupations utilizing input from professional associations, state technical committees, and other representatives for the private sector.

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INTRODUCTION

AGRIBUSINESS AND NATURAL RESOURCES EDUCATION

Agribusiness and Natural Resources Education includes various combinations of subject matter and learning experiences in agriculture production, agricultural supplies/services, agricultural mechanics, agricultural products processing, ornamental horticulture, agricultural (natural) resources, forestry, and planned leadership/employability skills. Opportunities for employment in agribusiness and natural resources occupations are found at all levels including technical, managerial, and professional.

The general purpose is to provide programs needed by persons for initial employment or to upgrade or retrain persons who are or have been employed in agribusiness and natural resources occupations. Stated more specifically, the following are the major objectives of vocational education in agribusiness and Natural Resources Education:

1. To develop agricultural competencies needed by individuals engaged in or preparing to engage in agribusiness and natural resources occupations.

2. To develop, through exploratory experiences, an understanding of, and an appreciation for, occupations in agribusiness and natural resources.

3. To develop the ability to secure satisfactory placement and advance in an agribusiness occupation through a program of continuing education.

4. To develop the abilities in human relations which are essential to success in agribusiness occupations.

5. To develop the abilities needed to exercise and follow effective leadership in fulfilling occupational, social, and civic responsibilities.

6. Reinforcement of basic skills in English, mathematics, and science appropriate for the job preparatory programs is provided through vocational classroom instruction and applied laboratory procedures or practice.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Introduction to Agriscience, Technology, and Environmental Sciences
Occupational Area:	Agriculture
	Secondary
Program Numbers	**8100120**
CIP Number	0101.9921EX
Grade Level	6-9, 30, 31
Length	0.5 credits
Certification	AGRI @4 AGRICULTUR 1 @2 EXP AG @4 VOC AGRI @4

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this course is to introduce students to the broad area of agriculture and to stimulate personal aptitudes, abilities, and interests in agriculture prior to orientation and exploration of careers.

The content includes, but is not limited to, agricultural literacy, importance of agriculture, importance of environmental resources and key relationships, the role of science and technology in agriculture, math and science, plants and animals, and sources of consumer goods from agriculture.

II. **LABORATORY ACTIVITIES**: Hands-on laboratory experiences are an integral part of this course including the safe use of laboratory and field tools.

III. **SPECIAL NOTE:**: None

IV. **INTENDED OUTCOMES**: After successfully completing this course, the student will be able to:

01.0 Identify the importance of agriculture.
02.0 Identify the importance of environmental resources.
03.0 Demonstrate the relationship between science, technology and agriculture.
04.0 Integrate the use of mathematics and communications in agriscience and technology.
05.0 Describe chains between producer and consumer for agricultural products.
06.0 Use selected techniques to produce finished products from agricultural materials.
07.0 Describe the importance of plants and animals in agriculture.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Introduction To Agrisience, Technology, and Environmental Sciences
Secondary Number: 8100120
Postsecondary Number:

01.0 IDENTIFY THE IMPORTANCE OF AGRICULTURE--The student will be able to:

01.01 Define agriculture, including its diversity and scope.
01.02 Describe the importance of agriculture on a world, national, state and community scale.
01.03 Describe the importance of agriculture in each individual's lives.
01.04 Collect and discuss information on current agricultural events.
01.05 Trace the evolution of agriculture.
01.06 Identify conditions necessary for agricultural production (climate, soil, available land, etc.).
01.07 Identify the major agricultural production areas of the United States and Florida.
01.08 Describe the diversity of career opportunities in agriscience and technology.

02.0 IDENTIFY THE IMPORTANCE OF ENVIRONMENTAL RESOURCES--The student will be able to:

02.01 Define environmental resources.
02.02 Describe the relationship between environmental resources and agriculture.
02.03 Describe the relationship between environmental resources and the quality of life.
02.04 Identify major threats to environmental resources.
02.05 Identify possible solutions to threats to environmental resources.

03.0 DEMONSTRATE THE RELATIONSHIP BETWEEN SCIENCE, TECHNOLOGY AND AGRICULTURE--The student will be able to:

03.01 Apply the scientific method to solve an agricultural problem (conduct an experiment).
03.02 Describe the technology used in agricultural production.
03.03 Describe the technology used in processing and marketing agricultural products.

04.0 INTEGRATE THE USE OF MATHEMATICS AND COMMUNICATIONS IN AGRISCIENCE AND TECHNOLOGY--The student will be able to:

04.01 Apply basic mathematic operations to solve agricultural problems.
04.02 Correctly use measuring devices (rulers, thermometers, weight scales, etc.) and utilize measurements to solve agricultural problems.

04.03 Prepare written materials using correct English grammar.

04.04 Identify the main idea in oral presentations and written materials.

05.0 DESCRIBE CHAINS BETWEEN PRODUCER AND CONSUMER FOR AGRICULTURAL PRODUCTS--The student will be able to:

05.01 Identify the agricultural source of consumer products.

05.02 Trace the development of an agricultural product from the producer to the consumer (ex: wheat on farm to bread in grocery store).

06.0 USE SELECTED TECHNIQUES TO PRODUCE FINISHED PRODUCTS FROM AGRICULTURAL MATERIALS--The student will be able to:

06.01 Complete a project safely using agricultural tools, machinery or equipment.

06.02 Prepare and process an agricultural product.

06.03 Propagate environmental horticulture plants.

07.0 DESCRIBE THE IMPORTANCE OF PLANTS AND ANIMALS IN AGRICULTURE--The student will be able to:

07.01 Identify plants and animals important in agriculture.

07.02 Describe the animal industries responsibilities regarding animal care and welfare.

07.03 Demonstrate the proper handling of small animals.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Orientation to Agriscience, Technology and Environmental Sciences
Occupational Area:	Agriculture
	Secondary
Program Numbers	**8100110**
CIP Number	0101.99100R
Grade Level	6-9, 30, 31
Length	0.5 credits
Certification	AGRI @4 AGRICULTUR 1 @2 EXP AG @4 VOC ARGI @4

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this course is to acquaint students with career opportunities, job requirements, and tasks performed in a broad range of agribusiness and natural resources occupations.

The content includes, but is not limited to, agriscience and technology careers, the kinds of jobs and workers involved, career paths, financial rewards, educational requirements, equipment and terminology, the free enterprise system, and consumer and economic education.

II. **LABORATORY ACTIVITIES**: Hands-on laboratory experiences are an integral part of this course including the safe use of field hand tools, basic mechanics' hand tools and basic hand carpentry tools.

III. **SPECIAL NOTE**: None

IV. **INTENDED OUTCOMES**: After successfully completing this course, the student will be able to:

01.0 Demonstrate knowledge and skills in agricultural research and related professions.
02.0 Demonstrate knowledge and skills in agricultural production.
03.0 Demonstrate knowledge and skills in agricultural supplies, sales and service.
04.0 Demonstrate knowledge and skills in agricultural mechanization and engineering.
05.0 Demonstrate knowledge and skills in agricultural processing and marketing (distribution and marketing).
06.0 Demonstrate knowledge and skills in environmental horticulture.
07.0 Demonstrate knowledge and skills in forestry.
08.0 Demonstrate knowledge and skills in environmental resources.
09.0 Demonstrate knowledge and skills in agricultural education and communication.
10.0 Demonstrate concepts of free enterprise and consumer economics.
11.0 Demonstrate employability and social skills.

12.0 Explore individual interests and aptitudes as they relate to a career.
13.0 Demonstrate leadership and communication skills.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Orientation To Agriscienc, Technology and Environmental Sciences
Secondary Number: 8100110
Postsecondary Number:

01.0 DEMONSTRATE KNOWLEDGE AND SKILLS IN AGRICULTURAL RESEARCH AND RELATED PROFESSIONS--The student will be able to:

01.01 Define the scope of agricultural research and the related professions.
01.02 Discuss the impact of agricultural research on agriculture and our society.
01.03 Identify the process by which agricultural research is conducted (including the scientific method).
01.04 Conduct a scientific experiment to solve an agricultural problem or answer an agricultural question.

02.0 DEMONSTRATE KNOWLEDGE AND SKILLS IN AGRICULTURAL PRODUCTION--The student will be able to:

02.01 Define agricultural production.
02.02 Describe products of agricultural production.
02.03 Grow/raise an agricultural plant or animal.
02.04 Discuss impact of science and technology on production agriculture and our society.

03.0 DEMONSTRATE KNOWLEDGE AND SKILLS IN AGRICULTURAL SUPPLIES, SALES AND SERVICES--The student will be able to:

03.01 Define agricultural supplies and services.
03.02 Identify agricultural supplies.
03.03 Identify agricultural services.
03.04 Demonstrate knowledge of agricultural supplies and services by completing a project related to this area.

04.0 DEMONSTRATE KNOWLEDGE AND SKILLS IN AGRICULTURAL MECHANIZATION AND ENGINEERING--The student will be able to:

04.01 Define the scope of agricultural mechanization and engineering.
04.02 Discuss the impact of agricultural mechanization and engineering on our society.
04.03 Identify tools, machines, and equipment used in agriculture.
04.04 Complete a project safely using agricultural tools, machinery, or equipment.

05.0 DEMONSTRATE KNOWLEDGE AND SKILLS IN AGRICULTURAL PROCESSING AND MARKETING (DISTRIBUTION AND MARKETING)--The student will be able to:

05.01 Define agricultural processing.
05.02 Describe the processing of agricultural products.

05.03 Define agricultural marketing.
05.04 Describe the marketing of agricultural products.
05.05 Prepare and process an agricultural product.
05.06 Market an agricultural product.

06.0 DEMONSTRATE KNOWLEDGE AND SKILLS IN ENVIRONMENTAL HORTICULTURE--The student will be able to:

06.01 Define environmental horticulture.
06.02 Describe the different types of environmental horticulture enterprises.
06.03 Identify environmental horticulture plants.
06.04 Propagate environmental horticulture plants.
06.05 Maintain environmental horticulture plants.

07.0 DEMONSTRATE KNOWLEDGE AND SKILLS IN FORESTRY--The student will be able to:

07.01 Define forestry.
07.02 Identify forest products.
07.03 Describe modern forest management techniques.
07.04 Identify trees commonly found in Florida.
07.05 Develop a specimen collection of local forest trees.
07.06 Plant a forest tree.

08.0 DEMONSTRATE KNOWLEDGE AND SKILLS IN ENVIRONMENTAL RESOURCES--The student will be able to:

08.01 Define renewable and nonrenewable natural resources.
08.02 Identify renewable and nonrenewable natural resources.
08.03 Describe agricultural management practices that conserve natural resources.
08.04 Describe effects of pollution on the environment (soil, water, air).
08.05 Recycle or conserve a natural resource.

09.0 DEMONSTRATE KNOWLEDGE AND SKILLS IN AGRICULTURAL EDUCATION AND COMMINICATION--The student will be able to:

09.01 Define the scope of agricultural education and communications.
09.02 Discuss the importance of education and communication as it relates to agricultural research and technology and the general public.
09.03 Identify sources of agricultural information and disinformation.
09.04 Develop an agricultural communique (newsletter, fact sheet, poster, etc.) to inform the general public about an agricultural issue.

10.0 DEMONSTRATE CONCEPTS OF FREE ENTERPRISE AND CONSUMER ECONOMICS--The student will be able to:

10.01 Define "free enterprise."
10.02 Define the terms "supply" and "demand."
10.03 Compare cost, quality and quantity of consumer items.

10.04 Identify and compare USDA standards and grades for agricultural products.
10.05 Describe how processing, packaging, and marketing effects the price of an item.
10.06 Recognize misleading advertising.

11.0 DEMONSTRATE EMPLOYABILITY AND SOCIAL SKILLS--The student will be able to:

11.01 Identify qualities and characteristics of a good employee.
11.02 Identify acceptable social skills.

12.0 EXPLORE INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

12.01 Describe individual strengths and weaknesses.
12.02 Discuss individual interests related to a career.
12.03 Identify careers within a specific area of agritechnology.
12.04 Explore careers within specific areas of interest.

13.0 DEMONSTRATE LEADERSHIP AND COMMUNICATION SKILLS--The student will be able to:

13.01 Describe the aims and purposes of the FFA organization.
13.02 Identify opportunities available to FFA members.
13.03 Identify characteristics of a good leader.
13.04 Participate in a cooperative leadership development activity.
13.05 Identify importance of effective communication skills.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Exploration of Agriscience, Technology and Environmental Sciences
Occupational Area:	Agriculture
	Secondary
Program Numbers	**8100210**
CIP Number	0101.9920EX
Grade Level	6-9, 30, 31
Length	0.5 credits
Certification	AGRI @4 AGRICULTUR 1 @2 EXP AG @4 VOC AGRI @4

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this course is to give students initial exposure to the skills and attitudes associated with a broad range of career opportunities relating to agribusiness and natural resources, including job requirements and tasks performed, to assist students in making informed decisions regarding their future academic and occupational goals.

The content includes, but is not limited to instruction that explores the tasks, training, education and physical requirements of a broad range of agribusiness and natural resources careers.

II. **LABORATORY ACTIVITIES**: Hands-on laboratory experiences are an integral part of this course including the safe use of field hand tools, basic mechanics' hand tools and basic carpentry tools.

III. **SPECIAL NOTE**: None

IV. **INTENDED OUTCOMES**: After successfully completing this course, the student will be able to:

01.0 Apply knowledge and skills in the area of agricultural research and related professions.
02.0 Apply knowledge and skills in agricultural production.
03.0 Apply knowledge and skills in agricultural supplies, sales and services.
04.0 Apply knowledge and skills in agricultural mechanization and engineering.
05.0 Apply knowledge and skills in agricultural processing and marketing (distribution and marketing).
06.0 Apply knowledge and skills in environmental horticulture.
07.0 Apply knowledge and skills in forestry.
08.0 Apply knowledge and skills in environmental resources.
09.0 Apply knowledge and skills in agricultural education and communication.
10.0 Apply concepts of free enterprise and consumer economics.

11.0 Apply knowledge of basic computer literacy.
12.0 Demonstrate the value of reponsibility, good work habits, and planning for career opportunities in agriculture.
13.0 Apply leadership and communication skills.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Exploration Of Agriscience, Technology and Environmental Sciences
Secondary Number: 8100210
Postsecondary Number:

01.0 APPLY KNOWLEDGE AND SKILLS IN THE AREA OF AGRICULTURAL RESEARCH AND RELATED PROFESSIONS--The student will be able to:

- 01.01 Identify agricultural research systems/networks (USDA, Cooperative Extension Service, IFAS, private industry).
- 01.02 Select and study a problem that can be tested under controlled conditions to establish a hypothesis or to illustrate a known law.
- 01.03 Identify areas and types of research in agriculture.

02.0 APPLY KNOWLEDGE AND SKILLS IN AGRICULTURAL PRODUCTION--The student will be able to:

- 02.01 Produce an agricultural crop.
- 02.02 Raise and care for an animal (livestock, aquaculture, specialty animal).
- 02.03 Discuss the development of new crops and animal improvements (hybridization, gene-splicing, etc).

03.0 APPLY KNOWLEDGE AND SKILLS IN AGRICULTURAL SUPPLIES, SALES AND SERVICES--The student will be able to:

- 03.01 Identify agribusinesses that provide supplies and services in the local area.
- 03.02 Identify the recommended uses and safety precautions from a pesticide label.
- 03.03 Participate in activities designed to apply knowledge and skills in agricultural supplies, sales and services.

04.0 APPLY KNOWLEDGE AND SKILLS IN AGRICULTURAL MECHANIZATION AND ENGINEERING--The student will be able to:

- 04.01 Safely use machines and tools.
- 04.02 Design a machine or tool to meet a need in agriculture.

05.0 APPLY KNOWLEDGE AND SKILLS IN AGRICULTURAL PROCESSING AND MARKETING (DISTRIBUTION AND MARKETING)--The student will be able to:

- 05.01 Identify processing and packaging techniques used on agricultural products (irradiation, dehydration, vacuum packing).
- 05.02 Prepare and process an agricultural product.
- 05.03 Determine how processing affects the consumer cost of an agricultural product.

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05.04 Trace the storage, packaging and distribution of agricultural products.
05.05 Discuss the difference in marketing strategies between perishable and nonperishable commodities.
05.06 Develop a merchandising plan for an agricultural product.

06.0 APPLY KNOWLEDGE AND SKILLS IN ENVIRONMENTAL HORTICULTURE--The student will be able to:

06.01 Identify foliage and landscape plants.
06.02 Propagate foliage and landscape plants (tissue culture, cuttings, seeds).
06.03 Compare landscaping methods (conventional vs. enviroscaping).
06.04 Develop a landscape design.
06.05 Maintain landscape plants.

07.0 APPLY KNOWLEDGE AND SKILLS IN FORESTRY--The student will be able to:

07.01 Identify the major forest regions of the United States and Florida.
07.02 Describe the importance of forests and forest products.
07.03 Identify trees of economic importance.
07.04 Describe how trees grow and reproduce.
07.05 Identify requirements necessary for establishing and maintaining forest trees.
07.06 Use tools and techniques common to the forest industry.

08.0 APPLY KNOWLEDGE AND SKILLS IN ENVIRONMENTAL RESOURCES--The student will be able to:

08.01 Define terms relating to natural resources and environmental education (conservation, environment, ecosystem, ecotone, food chain, food web, flora, fauna, etc).
08.02 Identify methods or practices of conserving natural resources.
08.03 Demonstrate a method or practice of conservation (water conservation, composting, recycling, soil erosion control).
08.04 Identify major ecosystems in Florida (wetlands, high hammock, mangrove, etc.).
08.05 Discuss the importance of the ecosystems to agriculture, society, and each other.

09.0 APPLY KNOWLEDGE AND SKILLS IN AGRICULTURAL EDUCATION AND COMMUNICATION--The student will be able to:

09.01 Discuss why people representing agriculture must be good educators and communicators (ex: to inform the general public about agricultural issues).
09.02 Identify methods by which the agricultural industry communicates with others (television, radio, magazines and journals, lobbyists).
09.03 Use effective teaching and/or communication skills to present a lesson, deliver a speech, or conduct a demonstration.

10.0 APPLY CONCEPTS OF FREE ENTERPRISE AND CONSUMER ECONOMICS--The student will be able to:

- 10.01 Describe how the free enterprise system is beneficial to agricultural producers and consumers.
- 10.02 Define the law of supply and demand.
- 10.03 Describe how competition benefits the consumer.
- 10.04 Observe the market price of an agricultural commodity over a period of time.

11.0 APPLY KNOWLEDGE OF BASIC COMPUTER LITERACY--The student will be able to:

- 11.01 Describe how computers are used in agriculture.
- 11.02 Identify types of computer programs and how they are used in agriculture (word processing, spread sheets, graphics).
- 11.03 Use a computer to assist in the completion of an agricultural project.

12.0 DEMONSTRATE THE VALUE OF RESPONSIBILITY, GOOD WORK HABITS, AND PLANNING FOR CAREER OPPORTUNITIES IN AGRICULTURE--The student will be able to:

- 12.01 Identify attitudes and habits that help people achieve career success.
- 12.02 Discuss how poor attitudes and habits can be changed.
- 12.03 Describe personality aspects to consider when choosing a career.
- 12.04 Identify the basic steps in career planning.
- 12.05 Assess present state of career plans.
- 12.06 Develop basic career plan.

13.0 APPLY LEADERSHIP AND COMMUNICATION SKILLS--The student will be able to:

- 13.01 Discuss the establishment and evolution of the FFA organization.
- 13.02 Identify the responsibilities of organizational officers.
- 13.03 Demonstrate parliamentary procedure skills during a meeting.
- 13.04 Participate on a committee which has an assigned task and report to the class.
- 13.05 Demonstrate effective communication skills.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Fundamentals of Agriscience
Occupational Area:	Agriculture
	Secondary
Program Numbers	**8100320**
CIP Number	0101.9931PA
Grade Level	9-12, 30, 31
Length	1 credits
Certification	VOC AGRI @4 AGRI @4 AGRICULTUR 1 @2

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this course is to provide students with skills and competencies basic to the science of agriculture.

The content includes, but is not limited to, instruction in plant science, animal science, soil science, agricultural mechanics, natural resources and conservation, communication and employability skills.

II. **LABORATORY ACTIVITIES**: Agricultural shop and land laboratory activities are an integral part of this course including the safe use of mechanics' hand tools, field hand tools, oxy-acetylene torches, arc welders, small gasoline engines and tractors.

III. **SPECIAL NOTE**: FFA is the appropriate vocational student organization for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Practical individualized experiences are recommended for each student enrolled in this course. These planned and supervised activities may be provided through directed laboratory experiences, student projects or placement for experience.

IV. **INTENDED OUTCOMES**: After successfully completing this course, the student will be able to:

01.0 Describe the unique relationship between Agriscience and the environment.
02.0 Initiate a supervised agricultural experience (SAE) program based on identified career opportunities.
03.0 Demonstrate basic leadership skills in parliamentary procedure, public speaking, and group dynamics.
04.0 Demonstrate basic skills in natural resources.
05.0 Demonstrate basic skills in pest management.
06.0 Demonstrate the fundamental skills in plant science.

07.0 Demonstrate the aesthetic and environmental use of plants.
08.0 Demonstrate the basic skills in animal science.
09.0 Demonstrate the fundamental skills in food science and technology.
10.0 Demonstrate the basic skills in agricultural business management.
11.0 Demonstrate the basic mechanical skills.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Fundamentals Of Agriscience
Secondary Number: 8100320
Postsecondary Number:

01.0 DESCRIBE THE UNIQUE RELATIONSHIP BETWEEN AGRISCIENCE AND THE ENVIRONMENT--The student will be able to:

01.01 Identify the major sciences that explain the development, existence, and improvement of living things.
01.02 Describe the elements of a healthful environment.
01.03 Describe the efforts made to improve the environment.

02.0 INITIATE A SUPERVISED AGRICULTURAL EXPERIENCE (SAE) PROGRAM BASED ON IDENTIFIED CAREER OPPORTUNITIES--The student will be able to:

02.01 Identify career opportunities in agriscience.
02.02 Identify how careers are classified and determine preparation requirements.
02.03 Plan a supervised agricultural experience program.
02.04 Demonstrate employability skills.

03.0 DEMONSTRATE BASIC LEADERSHIP SKILLS IN PARLIAMENTARY PROCEDURE, PUBLIC SPEAKING, AND GROUP DYNAMICS--The student will be able to:

03.01 Explain the importance of effective leadership in agriscience.
03.02 Prepare and present an oral report.
03.03 Prepare and submit a written report on an agriscience topic.
03.04 Describe the opportunities available through the FFA organization.

04.0 DEMONSTRATE BASIC SKILLS IN NATURAL RESOURCES--The student will be able to:

04.01 Determine the major sources of air pollution and identify procedures for maintaining and improving air quality.
04.02 Determine the relationships between water and soil in our environment and determine practices for conserving these resources.
04.03 Determine the origin and classification of soils, and identify effective procedures for soils and hydroponics management.
04.04 Compare the relationship of forests to our environment and select practices for utilizing forest resources.
04.05 Describe the relationship between wildlife and the environment and identify approved practices in managing wildlife enterprises.
04.06 Identify the biological requirements necessary for the production of aquatic plants and animals.

05.0 DEMONSTRATE BASIC SKILLS IN PEST MANAGEMENT--The student will be able to:

05.01 Identify the major pest groups and the importance of effective pest management programs.
05.02 Classify the nature of chemicals used to control pests.
05.03 Define terms regarding chemical safety.
05.04 Demonstrate safety in the use of chemicals.

06.0 DEMONSTRATE THE FUNDAMENTAL SKILLS IN PLANT SCIENCE--The student will be able to:

06.01 Identify the major parts of plants and state the important functions of each.
06.02 State how plants make food.
06.03 Describe the relationships among air, soil, water, and essential plant nutrients.
06.04 Identify the methods used by plants to reproduce themselves and demonstrate propagation technology.
06.05 Plan, plant and manage a garden.
06.06 Identify the basic principles of fruit and nut production.
06.07 Identify the basic principles of vegetable production.
06.08 Identify the major crops grown for grain, oil, and special purposes.
06.09 Identify the major crops grown for forage and pasture.

07.0 DEMONSTRATE THE AESTHETIC AND ENVIRONMENTAL USES OF PLANTS--The student will be able to:

07.01 Identify and maintain indoor plants.
07.02 State the basic cultural practices for turfgrass production and maintenance.
07.03 Identify and maintain trees and shrubs.

08.0 DEMONSTRATE THE BASIC SKILLS IN ANIMAL SCIENCE--The student will be able to:

08.01 Determine the basic nutritional requirements of animals.
08.02 Identify the factors promoting and maintaining animal health.
08.03 Define terms associated with animal genetics and reproduction, and describe the principles of genetics.
08.04 Identify the types, uses, care, and management of small animals.
08.05 Identify major types and classes of livestock and horses.

09.0 DEMONSTRATE THE FUNDAMENTAL SKILLS IN FOOD SCIENCE AND TECHNOLOGY--The student will be able to:

09.01 Compare procedures for marketing plants and animal products.
09.02 Describe the elements, trends, and career opportunities in the food industry.
09.03 Describe the nutrient requirements for human health.
09.04 Identify the processes used in food science.

10.0 DEMONSTRATE THE BASIC SKILLS IN AGRICULTURAL BUSINESS MANAGEMENT--The student will be able to:

10.01 Define management terms and determine how decisions are made.

10.02 Define and describe entrepreneurship.
10.03 Solve basic arithmetic problems associated with agribusiness management.

11.0 DEMONSTRATE THE BASIC MECHANICAL SKILLS--The student will be able to:

11.01 Identify basic hardware and fasteners.
11.02 State the safety precautions and demonstrate appropriate behavior while working in the shop area.
11.03 Identify the basic principles and use of electricity.
11.04 Identify and correctly use hand and power tools common to the agricultural shop.
11.05 Identify the controls and safely operate a farm tractor.
11.06 Describe the basic operation of internal combustion engines.
11.07 Service and operate small gasoline engines.
11.08 Plan and construct a small woodworking project.
11.09 Solve basic arithmetic problems associated with agriculture mechanics.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Agribusiness Cooperative Education - OJT	
Occupational Area:	Agriculture	
	Secondary	PSAV
Program Numbers	**8100410**	**A019999**
CIP Number	0101.9999CP	0101.9999CP
Grade Level	9-12, 30, 31	30, 31
Length	Multiple credits	Multiple hours
Certification	VOC AGRI @4 AGRI @4 AGRICULTUR 1 @2 ¶ANY AG ED G	VOC AGRI @4 AGRI @2 @4 AGRICULTUR 1 @2 ANY AG ED G

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this course is to provide an on-the-job training component in conjunction with a job preparatory program to prepare students for employment in agricultural occupations. On-the-job experiences are provided as an addition to a job preparatory program which will develop occupational competencies required for employment in the occupation chosen by the student as a career choice or to provide experiences that further develop the competencies acquired by the student in an in-school job preparatory program. This method of delivery is not intended for supplemental vocational course instruction and shall not be claimed for supplemental FTE purposes.

II. **LABORATORY ACTIVITIES**: A work station is provided as required to support the on-the-job training activities of the student.

III. **SPECIAL NOTE**: FFA (secondary) and the National Post-secondary Agricultural Student Organization (postsecondary) are the appropriate vocational student organizations for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

For the on-the-job training component, the following is required for each student: a training plan, signed by the student, teacher and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks which are relevant to the occupation which the student has chosen as a career goal. The student must receive compensation for work performed. It is recommended that for every twenty students (or portion thereof) enrolled in the program, the teacher-coordinator be given a minimum of one hour of OJT-coordination release time per day so that he/she can visit students on the job to manage the cooperative method of instruction effectively. The teacher/coordinator must visit each job site a minimum of once during each grading period for the purpose of evaluating the student's progress in attaining the competencies listed in the training plan.

The Cooperative - OJT course may be taken by a student for one or more semesters. A student may earn multiple credits in this course. The specific student performance standards which the student must master to earn credit must be specified in the OJT training plan.

IV. **INTENDED OUTCOMES:** After successfully completing this course, the student will be able to:

01.0 Perform designated job skills.
02.0 Demonstrate work ethics.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title:	Agribusiness Cooperative Education - OJT
Secondary Number:	8100410
Postsecondary Number:	A019999

01.0 PERFORM DESIGNATED JOB SKILLS--The student will be able to:

01.01 Demonstrate job performance skills.
01.02 Apply safety procedures on the job.
01.03 Maintain appropriate records.
01.04 Display a high level of productivity.

02.0 DEMONSTRATE WORK ETHICS--The student will be able to:

02.01 Demonstrate ethical practices.
02.02 Follow directions.
02.03 Interact with employer and co-workers.
02.04 Interact with customers and clients.
02.05 Display a positive attitude toward the job.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Agricultural Business Technology
Occupational Area:	Agriculture
	PSV
CIP Number	0101.010100
Grade Level	College Credits
Length	AS Degree
Certification	

I. **MAJOR CONCEPTS/CONTENT:** The purpose of this program is to prepare students for employment as supervisors, farm, forest, agriculture (72002526), general farm managers, farm (180.167-018), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, instruction that prepares individuals to apply the economic and business principles involved in the organization, operation and management of farms and agricultural businesses. Subject matter includes finance, laws, labor, machinery, facilities, and marketing, as well as leadership, communication, employability and human relations skills.

II. **LABORATORY ACTIVITIES:** Land laboratory activities are an integral part of this program including the safe use of agricultural equipment, facilities, irrigation equipment, chemical applicators and power sprayers.

III. **SPECIAL NOTE:** National Postsecondary Agricultural Student Organization is the appropriate vocational student organization for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Planned and supervised occupational activities may be provided through directed laboratory experience, practicum or cooperative experience. Whenever the cooperative method of instruction is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks which are relevant to the occupation which the student has chosen as a career goal. The student must receive compensation for work performed.

The typical length of this program for the average achieving student is an associate degree. The standard credit hour length for this program is 60 hours.

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01.0 Obtain and dispose of an agricultural enterprise.
02.0 Manage and supervise labor.
03.0 Manage the crop and/or livestock plan.
04.0 Manage the machinery and equipment programs.
05.0 Manage facilities and structures.
06.0 Select sources and methods of financing operation.
07.0 Manage finances and records.
08.0 Interpret and apply state and federal rules and regulations to enterprise.
09.0 Identify sources of agricultural information and assistance.
10.0 Analyze market information.
11.0 Analyze contracts, leases and other legal documents.
12.0 Demonstrate leadership, employability, communication and human relations skills.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Agricultural Business Technology
Secondary Number:
Postsecondary Number: 0101.010100

01.0 OBTAIN AND DISPOSE OF AN AGRICULTURAL ENTERPRISE--The student will be able to:

01.01 Establish and record agribusiness goals.
01.02 Develop plan for type and size of agricultural enterprise.
01.03 Obtain title to agricultural real estate.
01.04 Complete farm rental/lease agreement.
01.05 Purchase building insurance.
01.06 Purchase liability insurance.
01.07 Transfer agribusiness ownership.

02.0 MANAGE AND SUPERVISE LABOR--The student will be able to:

02.01 Develop labor supply plan.
02.02 Hire and dismiss employees.
02.03 Establish and record pay scale and benefits for workers.
02.04 Train workers using demonstration performance method.
02.05 Develop employee work schedules.
02.06 Contract for custom services.
02.07 Prepare payroll records.

03.0 MANAGE THE CROP AND/OR LIVESTOCK PLAN--The student will be able to:

03.01 Prepare land use plan.
03.02 Prepare plan for cropping program.
03.03 Develop budget for changing crop program.
03.04 Prepare inventory of harvested crops.
03.05 Enroll in Agricultural Stabilization Conservation Service program.
03.06 Enroll in and review Soil Conservation Service practices.
03.07 Contract for custom crop production/harvesting services.
03.08 Contract out to perform custom crop services for others.
03.09 Develop crop marketing plan.
03.10 Purchase crop insurance.
03.11 Apply for collection on insured crops.
03.12 Develop plan for purchase and operation of irrigation system.
03.13 Develop fertilization plan.
03.14 Develop pesticide plan.
03.15 Develop plan to meet seed/plant needs.
03.16 Develop livestock program plan.
03.17 Develop plan for raising young stock.
03.18 Plan budget for changing the livestock program.
03.19 Determine plan for livestock feeding program.
03.20 Develop livestock marketing plan.
03.21 Market livestock/livestock products.
03.22 Contract for breeding services.

03.23 Enroll in livestock improvement program.
03.24 Purchase livestock insurance.

04.0 MANAGE THE MACHINERY AND EQUIPMENT PROGRAMS--The student will be able to:

04.01 Develop budgets for changing the machinery and equipment program.
04.02 Prepare inventory of farm machinery and equipment.
04.03 Trade farm machinery and equipment.
04.04 Obtain machinery and equipment by purchase, rent, or lease.
04.05 Prepare inventory of machinery and equipment repair parts, fuel, and lubricants.
04.06 Prepare or contract for fuel, oil, and grease for machinery and equipment.
04.07 Purchase and stock machinery and equipment repair parts.
04.08 Purchase farm shop supplies.
04.09 Purchase machinery and equipment insurance.
04.10 Develop plan for machinery and equipment maintenance program.

05.0 MANAGE FACILITIES AND STRUCTURES--The student will be able to:

05.01 Plan for the expansion of existing facilities or construction of new facilities.
05.02 Develop plan for repairing, remodeling, and improving facilities.
05.03 Acquire buildings by purchase, rental, or lease.
05.04 Purchase building supplies.

06.0 SELECT SOURCES AND METHODS OF FINANCING OPERATION--The student will be able to:

06.01 Analyze major sources of agricultural production credit.
06.02 Analyze and select sources of credit for capital items and real estate.
06.03 Prepare a case using accepted forms for obtaining credit from an agricultural lending institution.

07.0 MANAGE FINANCES AND RECORDS--The student will be able to:

07.01 Calculate and record depreciation.
07.02 Calculate and record net worth of business.
07.03 Calculate and record labor income.
07.04 Calculate and record management income.
07.05 Complete a comparative trend analysis table.
07.06 Complete a profit and loss statement.
07.07 Calculate an operating margin.
07.08 Calculate net cash operating income for one year.
07.09 Calculate and record capital gains and losses.
07.10 Calculate and record monthly/yearly receipts.
07.11 Calculate and record monthly/yearly operating expenses.
07.12 Balance bank statement.
07.13 Develop plan for bestowing the estate.
07.14 Fill out IRS income or loss schedule.

07.15 Fill out IRS capital gains and losses schedule.
07 16 Fill out IRS investment credit schedule.
07.17 Fill out IRS form 1040 schedule.
07.18 Keep crop production records.
07.19 Keep complete livestock records.

08.0 INTERPRET AND APPLY STATE AND FEDERAL RULES AND REGULATIONS TO ENTERPRISE--The student will be able to:

08.01 List agencies responsible for inspecting and regulating operation or product.
08.02 Secure necessary inspections, certificates and registrations.
08.03 Maintain a file of current rules and regulations relative to operation.
08.04 List reasons for the necessity of inspections, certification and regulations.

09.0 IDENTIFY SOURCES OF AGRICULTURAL INFORMATION AND ASSISTANCE--The student will be able to:

09.01 Keep and maintain a file of current technical information from universities, governmental agencies and commercial companies.
09.02 Maintain a reference file for periodicals and other publications.
09.03 Attend seminars and workshops to update skills and knowledge.
09.04 Use computer networking for up-to-date agricultural information.
09.05 Identify associations and societies associated with occupation or profession.

10.0 ANALYZE MARKET INFORMATION--The student will be able to:

10.01 Secure and interpret market information.
10.02 Select marketing channels for greatest profit.
10.03 Analyze market trends.
10.04 Market products.

11.0 ANALYZE CONTRACTS, LEASES AND OTHER LEGAL DOCUMENTS--The student will be able to:

11.01 Analyze and interpret land use maps.
11.02 Interpret a real estate legal description.
11.03 Identify major elements in lease agreements.
11.04 Identify major elements in contracts.
11.05 Secure legal services.

12.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATION AND HUMAN RELATIONS SKILLS--The student will be able to:

12.01 Conduct a job search.
12.02 Secure information about a job.
12.03 Identify documents that may be required when applying for a job.
12.04 Complete a job application form correctly.

12.05 Demonstrate competence in job interview techniques.
12.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
12.07 Identify acceptable work habits.
12.08 Demonstrate knowledge of how to make job changes appropriately.
12.09 Demonstrate acceptable employee health habits.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Agricultural Education Directed Study
Occupational Area:	Agriculture
	Secondary
Program Numbers	**8100100**
CIP Number	0101.999901
Grade Level	11-12, 30, 31
Length	Multiple credits
Certification	AGRI @4 VOC AGRI @4 AGRICULTUR 1 ¶ANY AGRICULTURE EDUC G

I. **MAJOR CONCEPTS/CONTENT:** The purpose of this course is to provide students with additional competencies in an Agricultural Education program that will enhance their opportunities for employment in the occupation chosen by the student.

The content is prescribed by the instructor based upon the individual student's assessed needs for directed study.

II. **LABORATORY ACTIVITIES**: A work station is provided as required to support the training activities of the student.

III. **SPECIAL NOTE**: FFA is the appropriate vocational student organization for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

This course may be taken only by a student who has completed or is currently completing a specific secondary job preparatory program or occupational completion point for additional study in this program. A student may earn multiple credits in this course.

The selected intended outcomes and student performance standards which the student must master to earn credit must be outlined in an instructional plan developed by the instructor.

The student enrolled in this course must be reported using the Course Code Directory program number for the specific occupational completion point.

IV. **INTENDED OUTCOMES**: After successfully completing this course, the student will be able to:

01.0 Perform designated job skills.

02.0 Demonstrate a knowledge of the basic skills in mathematics and language appropriate for the chosen occupation.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Agricultural Education
Secondary Number: 8100100
Postsecondary Number: Directed Study

01.0 PERFORM DESIGNATED JOB SKILLS--The student will be able to:

01.01 Demonstrate job performance skills.
01.02 Follow prescribed safety procedures.
01.03 Display increasingly higher levels of productivity.

02.0 DEMONSTRATE A KNOWLEDGE OF THE BASIC SKILLS IN MATHEMATICS AND LANGUAGE APPROPRIATE FOR THE CHOSEN OCCUPATION--The student will be able to:

02.01 Use addition, subtraction, multiplication, and division to solve problems encountered in the chosen occupation.
02.02 Read, understand, and find information relative to the chosen occupation.
02.03 Write logical and grammatically correct statements and reports with correct spelling appropriate for the chosen occupation.

01020400CL July 1997

Florida Department of Education
CLUSTER CURRICULUM FRAMEWORK

Cluster Title: Agricultural Mechanics
Cluster Type: Job Preparatory
Occupational Area: Agriculture And Natural Resources
Components: Three Programs, One Core, and Five Occupational Completion Points

	Secondary	PSAV
Grade Level	9-12, 30, 31	30, 31
Facility Code	204	204
VSO	FFA	PAS
Coop Method	Yes	Yes
Apprenticeship	Yes	Yes

I. **PURPOSE:** The purpose of the programs in this cluster is to prepare students for employment or advanced training in the agricultural mechanics and the agricultural machinery services and operations industry. The programs in this cluster also provide supplemental training for persons previously or currently employed in the agricultural mechanics industry.

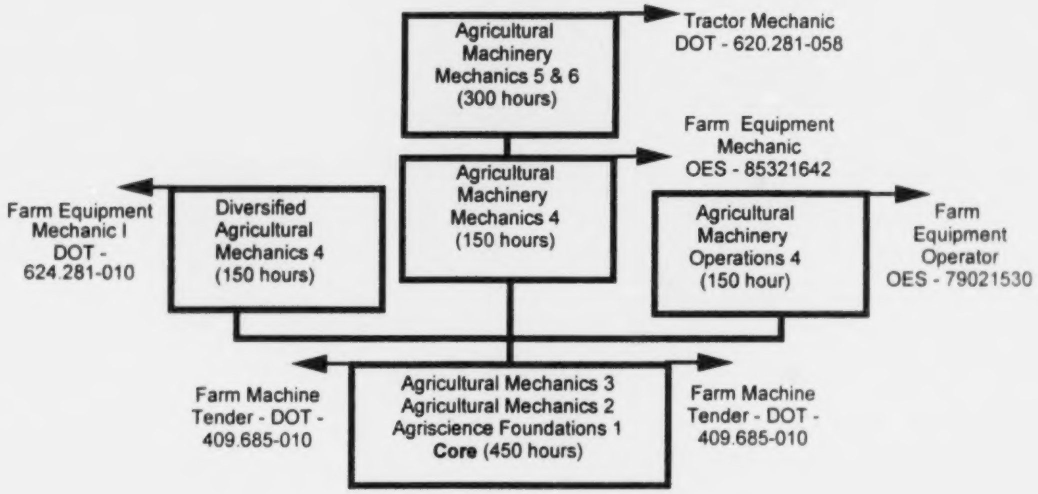
This cluster of programs focuses on broad, transferable skills, stresses the understanding of all aspects of the agricultural mechanics industry, and demonstrates elements of the industry such as planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues, and health, safety, and environmental issues.

II. **CLUSTER STRUCTURE:** This cluster is a planned sequence of instruction consisting of three programs with one common core and five occupational completion points. The recommended sequence allows students to complete specified portions of the program for employment or to remain for advanced training. A student who completes the applicable competencies at any occupational completion point may either continue in the training program or become an occupational completer.

It is recommended that students complete the core or demonstrate a mastery of the student performance standards contained in the core before advancing to the course(s) in the next level of any of the three programs: Agricultural Machinery Mechanics, Agricultural Machinery Operations and Diversified Agricultural Mechanics.

The following diagram illustrates the **CLUSTER STRUCTURE:**

AGRICULTURAL MECHANICS CLUSTER


Agricultural Machinery Mechanics 5 & 6 (300 hours)
Tractor Mechanic DOT - 620.281-058
Farm Equipment Mechanic OES - 85321642
Agricultural Machinery Mechanics 4 (150 hours)
Farm Equipment Mechanic I DOT - 624.281-010
Diversified Agricultural Mechanics 4 (150 hours)
Agricultural Machinery Operations 4 (150 hour)
Farm Equipment Operator OES - 79021530
Farm Machine Tender - DOT - 409.685-010
Agricultural Mechanics 3
Agricultural Mechanics 2
Agriscience Foundations 1
Core (450 hours)
Farm Machine Tender - DOT - 409.685-010

At the secondary level, this cluster of programs consists of the following courses, which include the core:

AGRICULTURAL MACHINERY MECHANICS PROGRAM - 6 secondary credits
CORE
8106810 - Agriscience Foundations 1
8103120 - Agricultural Mechanics 2
8103130 - Agricultural Mechanics 3

8103410 - Agricultural Machinery Mechanics 4
8103420 - Agricultural Machinery Mechanics 5
8103430 - Agricultural Machinery Mechanics 6

AGRICULTURAL MACHINERY OPERATIONS PROGRAM - 4 secondary credits
CORE
8106810 - Agriscience Foundations 1
8103120 - Agricultural Mechanics 2
8103130 - Agricultural Mechanics 3

8103210 - Agricultural Machinery Operations 4

DIVERSIFIED AGRICULTURAL MECHANICS PROGRAM - 4 secondary credits
CORE
8106810 - Agriscience Foundations 1
8103120 - Agricultural Mechanics 2
8103130 - Agricultural Mechanics 3

8103310 - Diversified Agricultural Mechanics 4

III. **SPECIAL NOTE**: FFA (for secondary) and the National Postsecondary Agricultural Student Organization (for postsecondary) are the appropriate vocational student organizations for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the curriculum in accordance with Rule 6A-6.064, FAC.

Classroom, shop, and laboratory activities are an integral part of this cluster. These activities include instruction in the use of the safety procedures, tools, equipment, materials, and processes found in the industry. Equipment and supplies should be provided to enhance hands-on experiences for students in the chosen occupation. A generic equipment list is available for the programs in this cluster.

The programs in this cluster may be offered in postsecondary adult vocational (PSAV) courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643, F.S.

Planned and supervised instructional activities must be provided through one or more of the following: (1) directed laboratory experience, (2) student projects, (3) placement for experience, (4) cooperative experience.

The cooperative method of instruction is appropriate for this program. Whenever the cooperative method is offered, the following are required for each student: a training plan that is signed by the student, teacher, and employer,including instructional objectives and a list of on-the-job and in-school learning experiences and a workstation that reflects the equipment, skills, and tasks that are relevant to the occupation that the student has chosen as a career goal. The student must be paid for work performed.

In accordance with Rule 6A-10.040, FAC, the minimum basic-skills grade levels required for postsecondary adult vocational students to exit the programs in this cluster are listed before the intended outcomes for the program. These grade-level numbers correspond to grade-equivalent scores obtained on one of the state-designated basic-skills examinations. If a student does not meet the basic-skills level required for completion from the program, remediation should be provided concurrently in the System for Applied Individualized Learning (SAIL). Please reference the Rule for exemptions.

When a secondary student with a disability is enrolled in a vocational class for which modifications to the curriculum framework have been made, the particular outcomes and student performance standards which the student must master to earn credit must be specified in the student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEPs. The job title for which the student is being trained must be designated in the IEP.

SCANS Competencies: To accomplish the Secretary's Commission on Achieving Necessary Skills (SCANS) competencies, instructional strategies for this cluster must include methods that require students to identify, organize, and use resources appropriately; to work with each other cooperatively and productively; to acquire and use information; to understand social, organizational, and technological systems; and to work with a variety of tools and equipment. Instructional strategies must also incorporate methods to improve students' personal qualities and higher-order thinking skills.

July 1997

Florida Department of Education
INTENDED OUTCOMES

Program Title: Agricultural Machinery Mechanics

	Secondary	PSAV
Program Number	**8103400**	**A010240**
CIP Number	0101.020410	0101.020410
Grade Level	9-12, 30, 31	30, 31
Length	6 credits	900 hours
Certification	VOC AGRI @4	VOC AGRI @4
	AGRI @4	AGRI @2 @4
	AGRI MECH #7	AGRI MECH @7 G
	AGRICULTUR 1 @2	AGRICULTUR 1 @2
Basic-Skills Grade Level		
	Math	8
	Language	8
	Reading	8

INTENDED OUTCOMES: After successfully completing the appropriate outcomes for each occupational completion point of this program, the student will be able to perform the following:

OCCUPATIONAL COMPLETION POINT - DATA CODE A
FARM MACHINE TENDER - DOT Code 409.685-010 (CORE)

01.0 Describe the socioeconomic role of the agricultural industry.
02.0 Apply scientific and technological principles to the agricultural industry.
03.0 Practice agricultural safety.
04.0 Demonstrate the use of tools, equipment, and instruments in the agricultural industry.
05.0 Describe the principles of integrated pest management (IPM).
06.0 Describe the principles of plant and/or animal growth and reproduction.
07.0 Apply business skills and economic principles to the agricultural industry.
08.0 Explain the basic marketing processes in the agricultural industry.
09.0 Demonstrate human-relations, communications, and leadership skills.
10.0 Practice personal, equipment, and shop safety.
11.0 Select and use hand and power tools.
12.0 Install simple electrical circuits.
13.0 Demonstrate electric and gas welding.
14.0 Service and maintain small gasoline engines.
15.0 Perform preventive maintenance, checks, and services for tractors.
16.0 Perform minor repairs on an irrigation system.
17.0 Apply basic financial-management skills.
18.0 Demonstrate employability skills.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
FARM EQUIPMENT MECHANIC - OES Code 85321642

19.0 Keep records.

20.0 Weld, braze, and cut, using appropriate equipment.
21.0 Operate, service, test, and maintain agricultural machinery and equipment.
22.0 Demonstrate positive customer-relations skills.

OCCUPATIONAL COMPLETION POINT - DATA CODE C
TRACTOR MECHANIC - DOT Code 620.281-058

23.0 Diagnose, service, and repair the lubrication system.
24.0 Diagnose, service, repair, and maintain the cooling system.
25.0 Diagnose, service, and repair the intake, exhaust, and turbo-charged systems.
26.0 Diagnose, service, and repair the fuel-delivery system.
27.0 Diagnose, service, repair, and maintain the brake system.
28.0 Diagnose, service, and repair internal-combustion engines.
29.0 Diagnose, service, and repair the electrical system, using service manuals.
30.0 Diagnose, service, and repair transmission systems.
31.0 Diagnose, service, repair, and maintain the hydraulic system.
32.0 Diagnose, service, and repair the final drive systems.
33.0 Apply business-management skills and identify appropriate legal documents.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title:	Agricultural Machinery Mechanics
Secondary Number:	8103400
Postsecondary Number:	A010240

OCCUPATIONAL COMPLETION POINT - DATA CODE A

FARM MACHINE TENDER - DOT Code 409.685-010 (CORE)

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.

01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.

01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.

01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.

02.02 Use the scientific method to solve problems in agriculture.

02.03 Explain the use of genetics in agriculture, including probability applications.

02.04 Analyze the impact of recent technology on the agricultural industry.

02.05 Identify and describe the components of an ecosystem both biotic and abiotic.

02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.

02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.

02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.

02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.

02.10 Explain the interaction of one natural resource on another.

02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.

02.12 Explain the flow of energy from the sun through agricultural systems.

02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.

02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.

06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC THE MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.
09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

10.0 PRACTICE PERSONAL, EQUIPMENT, AND SHOP SAFETY--The student will be able to:

10.01 Identify and eliminate hazards in agricultural mechanics settings.
10.02 Observe color-coded warnings in work areas and on equipment and machinery.
10.03 Describe appropriate actions in case of fire accident, or other emergencies.
10.04 Describe personal protective equipment (PPE) and appropriate clothing.
10.05 Demonstrate safety procedures and workplace "housekeeping" practices.
10.06 Safely handle and store flammable and non-restricted chemicals.
10.07 Operate machinery and equipment according to the safety recommendations of the manufacturers.
10.08 Comply with the Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) rules and regulations.
10.09 Describe the Florida "Right-to-Know" law (as recorded in Florida Statutes, Chapter 442).

11.0 SELECT AND USE HAND AND POWER TOOLS--The student will be able to:

11.01 Identify the capabilities and limitations of hand and power tools.
11.02 Select and safely use hand and power tools.
11.03 Select and use proper PPE for hand and power tools.
11.04 Identify worn, damaged, or abused tools.
11.05 Select and demonstrate the appropriate procedures for sharpening tools.

12.0 INSTALL SIMPLE ELECTRICAL CIRCUITS--The student will be able to:

12.01 Demonstrate the principles of AC and DC circuitry.
12.02 Demonstrate series and parallel circuitry.
12.03 Explain the scientific principles of electrical systems.
12.04 Plan and install a simple wiring system.
12.05 Test electrical circuits.

13.0 DEMONSTRATE ELECTRIC AND GAS WELDING--The student will be able to:

13.01 Select and use gas welding equipment.
13.02 Select and use electric arc-welding equipment and materials.

14.0 SERVICE AND MAINTAIN SMALL GASOLINE ENGINES--The student will be able to:

14.01 Explain the scientific principles of small engines.
14.02 Identify major parts and describe the general operation of small gasoline engines (2- and 4-stroke cycle).
14.03 Practice appropriate safety precautions.
14.04 Troubleshoot and perform minor repairs on small gasoline engines.

15.0 PERFORM PREVENTIVE MAINTENANCE, CHECKS, AND SERVICES FOR TRACTORS--The student will be able to:

15.01 Explain the scientific principles of hydraulic and transmission systems.
15.02 Perform daily operator maintenance checks for tractors.
15.03 Determine the preventive-maintenance procedures, using the tractor operator's manual.
15.04 Perform scheduled preventive-maintenance procedures.
15.05 Interpret and perform operator's trouble-shooting procedures as described in the manual.
15.06 Keep records of tractor maintenance and services.

16.0 PERFORM MINOR REPAIR ON AN IRRIGATION SYSTEM--The student will be able to:

16.01 Identify the basic components of irrigation systems.
16.02 Differentiate various types of irrigation systems.
16.03 Identify state and local regulatory agencies for water management.
16.04 Perform minor repair on an irrigation system.

17.0 APPLY BASIC FINANCIAL-MANAGEMENT SKILLS--The student will be able to:

17.01 Complete basic financial records.
17.02 Demonstrate the use of banking procedures.
17.03 Calculate interest on loans.
17.04 Complete selected income-tax-return forms.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct group meetings, using parliamentary procedures and public-speaking skills.
18.02 Identify the documents that are required for a job application.
18.03 Complete a job application form.
18.04 Demonstrate competencies in job-interview techniques.
18.05 Demonstrate a knowledge of how to make job changes appropriately.
18.06 Demonstrate acceptable personal hygiene and a professional appearance.
18.07 Apply the principles of time management, work simplification, and teamwork when performing assigned tasks.
18.08 Describe the importance of a drug-free workplace and the industry policies regarding alcohol and drug use.
18.09 Demonstrate appropriate responses to performance evaluation from employer, supervisor, or other persons in the workplace.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
FARM EQUIPMENT MECHANIC - OES Code 85321642

19.0 KEEP RECORDS--The student will be able to:

19.01 Explain the purpose and importance of keeping records.
19.02 Demonstrate procedures for keeping records of equipment maintenance and services.
19.03 Keep records on each job or project assignment.

19.04 Complete work orders, service invoices, and requisitions.
19.05 Prepare a written cost estimate of repair work and warranty claims.

20.0 WELD, BRAZE, AND CUT, USING APPROPRIATE EQUIPMENT--The student will be able to:

20.01 Set up, adjust, operate, and maintain MIG (middle inert gas) and TIG (tungsten inert gas) welding equipment.
20.02 Set up, adjust, and operate plasma cutting equipment.
20.03 Select recommended operational procedures and supplies for specific jobs.
20.04 Practice all recommended safety precautions.
20.05 Demonstrate the different welding positions.
20.06 Cut and pierce metals, using oxyacetylene and plasma.
20.07 Braze metals.
20.08 Apply hard-surface alloys.
20.09 Store welding equipment and supplies according to the recommended storage procedures.

21.0 OPERATE, SERVICE, TEST, AND MAINTAIN AGRICULTURAL MACHINERY AND EQUIPMENT--The student will be able to:

21.01 Operate and adjust agricultural machinery and equipment that are used in the local area, according to the operator's manuals, such as the following:
  a. agricultural wheel-type tractors
  b. planting equipment
  c. primary and secondary tillage equipment
  d. pesticide-application equipment
  e. harvesting equipment
  f. fertilization equipment
21.02 Remove, clean, test, repair, and reinstall parts of machinery and equipment, using repair manuals.
21.03 Service machinery, using service manuals.
21.04 Follow safety precautions when operating, servicing, and maintaining machines and equipment.

22.0 DEMONSTRATE POSITIVE CUSTOMER-RELATIONS SKILLS--The student will be able to:

22.01 Exercise self-control.
22.02 Identify and demonstrate appropriate responses to criticism.
22.03 Explain the effects of positive human-relations skills on success in the business.
22.04 Demonstrate respect for people and property.

OCCUPATIONAL COMPLETION POINT - DATA CODE C
TRACTOR MECHANIC - DOT Code 620.281-058

23.0 DIAGNOSE, SERVICE, AND REPAIR THE LUBRICATION SYSTEM--The student will be able to:

23.01 Change oil filters.

23.02 Check and change oils and other lubricants in engines.
23.03 Diagnose and replace damaged or worn components of the system.

24.0 DIAGNOSE, SERVICE, REPAIR, AND MAINTAIN THE COOLING SYSTEM--The student will be able to:

24.01 Test coolant.
24.02 Flush and clean the system.
24.03 Test and replace parts of the system.
24.04 Adjust parts of the system for proper operation.

25.0 DIAGNOSE, SERVICE, AND REPAIR THE INTAKE, EXHAUST, AND TURBO-CHARGED SYSTEMS--The student will be able to:

25.01 Troubleshoot the intake, exhaust, and turbo-charged systems, using recommended diagnostic equipment.
25.02 Repair and replace parts of the systems.
25.03 Service and adjust the systems for proper operation.

26.0 DIAGNOSE, SERVICE, AND REPAIR THE FUEL-DELIVERY SYSTEM, USING SERVICE MANUALS--The student will be able to:

26.01 Remove, clean, rebuild, and reinstall carburetors.
26.02 Bleed the diesel-fuel system.
26.03 Remove and reinstall a diesel-fuel-injection pump, according to the manufacturer's specifications.
26.05 Replace components of the fuel system.
26.06 Service and adjust parts of the fuel system for proper operation.

27.0 DIAGNOSE, SERVICE, REPAIR, AND MAINTAIN THE BRAKE SYSTEM--The student will be able to:

27.01 Drain, refill, and adjust the brake system.
27.02 Test brake-system components, using recommended diagnostic equipment.
27.03 Repair and replace parts of the system.
27.04 Service and adjust the system for proper operation.

28.0 DIAGNOSE, SERVICE, AND REPAIR INTERNAL-COMBUSTION ENGINES--The student will be able to:

28.01 Troubleshoot components of the engine, using recommended diagnostic equipment.
28.02 Repair and replace components of the basic engine, using repair manuals.
28.03 Service and adjust all parts of the engine for proper operation.

29.0 DIAGNOSE, SERVICE, AND REPAIR THE ELECTRICAL SYSTEM, USING SERVICE MANUALS--The student will be able to:

29.01 Troubleshoot the electrical system, using recommended diagnostic equipment.

29.02 Repair and replace components of the electrical system.
29.03 Service and adjust all parts of the system for proper operation.

30.0 DIAGNOSE, SERVICE, AND REPAIR TRANSMISSION SYSTEMS--The student will be able to:

30.01 Troubleshoot transmission components, using recommended diagnostic equipment.
30.02 Repair and replace parts of transmission systems.
30.03 Service and adjust parts of different transmission systems for proper operation.

31.0 DIAGNOSE, SERVICE, REPAIR, AND MAINTAIN THE HYDRAULIC SYSTEM--The student will be able to:

31.01 Change filters and drain, flush, and refill the hydraulic system.
31.02 Troubleshoot hydraulic-system components, using recommended diagnostic equipment.
31.03 Repair and replace parts of the system.
31.04 Service and adjust the system for proper operation.

32.0 DIAGNOSE, SERVICE, AND REPAIR THE FINAL-DRIVE SYSTEMS--The student will be able to:

32.01 Diagnose the final-drive systems, using recommended diagnostic equipment.
32.02 Repair and replace parts of the systems.
32.03 Service and adjust the systems for proper operation.

33.0 APPLY BUSINESS-MANAGEMENT SKILLS AND IDENTIFY APPROPRIATE LEGAL DOCUMENTS--The student will be able to:

33.01 Identify personal/business liability and the use of liability insurance.
33.02 Identify applicable insurance requirements.
33.03 Identify and complete basic business-tax-liability forms.
33.04 Identify the requirements of greenbelt-, bluebelt-, and homestead-tax exemptions.
33.05 Interpret enterprise budgets and amortization tables.
33.06 Identify characteristics of legal documents (such as contracts, deeds, and leases).
33.07 Identify applicable land-use and zoning regulations, including a comprehensive plan.

Program: 8103400 Agricultural Machinery Mechanics

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106810
Course Title: Agriscience Foundations I
Course Credit: 1

COURSE DESCRIPTION:

This course was developed as a core and is designed to develop competencies in the areas of agricultural history; global importance of agriculture; career opportunities; applied scientific and technological concepts; ecosystems; agricultural safety; principles of integrated pest management; principles of plant and animal growth; economic principles; agricultural marketing; and human-relations skills.

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.

02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.

09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8103120
Course Title: Agricultural Mechanics 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of safety; selection and use of tools; electrical circuits; and employability skills.

10.0 PRACTICE PERSONAL, EQUIPMENT, AND SHOP SAFETY--The student will be able to:

10.01 Identify and eliminate hazards in agricultural mechanics settings.
10.02 Observe color-coded warnings in work areas and on equipment and machinery.
10.03 Describe appropriate actions in case of fire accident, or other emergencies.
10.04 Describe personal protective equipment (PPE) and appropriate clothing.
10.05 Demonstrate safety procedures and workplace "housekeeping" practices.
10.06 Safely handle and store flammable and non-restricted chemicals.
10.07 Operate machinery and equipment according to the safety recommendations of the manufacturers.
10.08 Comply with the Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) rules and regulations.
10.09 Describe the Florida "Right-to-Know" law (as recorded in Florida Statutes, Chapter 442).

11.0 SELECT AND USE HAND AND POWER TOOLS--The student will be able to:

11.01 Identify the capabilities and limitations of hand and power tools.
11.02 Select and safely use hand and power tools.
11.03 Select and use proper PPE for hand and power tools.
11.04 Identify worn, damaged, or abused tools.
11.05 Select and demonstrate the appropriate procedures for sharpening tools.

12.0 INSTALL SIMPLE ELECTRICAL CIRCUITS--The student will be able to:

12.01 Demonstrate the principles of AC and DC circuitry.
12.02 Demonstrate series and parallel circuitry.
12.03 Explain the scientific principles of electrical systems.
12.04 Plan and install a simple wiring system.
12.05 Test electrical circuits.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct group meetings, using parliamentary procedures and public-speaking skills.
18.02 Identify the documents that are required for a job application.
18.03 Complete a job application form.
18.04 Demonstrate competencies in job-interview techniques.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8103130
Course Title: Agricultural Mechanics 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of welding; small gasoline engine service and repair; preventative maintenance procedures; irrigation system repair; financial management skills and employability skills.

13.0 DEMONSTRATE ELECTRIC AND GAS WELDING--The student will be able to:

- 13.01 Select and use gas welding equipment.
- 13.02 Select and use electric arc-welding equipment and materials.

14.0 SERVICE AND MAINTAIN SMALL GASOLINE ENGINES--The student will be able to:

- 14.01 Explain the scientific principles of small engines.
- 14.02 Identify major parts and describe the general operation of small gasoline engines (2- and 4-stroke cycle).
- 14.03 Practice appropriate safety precautions.
- 14.04 Troubleshoot and perform minor repairs on small gasoline engines.

15.0 PERFORM PREVENTIVE MAINTENANCE, CHECKS, AND SERVICES FOR TRACTORS--The student will be able to:

- 15.01 Explain the scientific principles of hydraulic and transmission systems.
- 15.02 Perform daily operator maintenance checks for tractors.
- 15.03 Determine the preventive-maintenance procedures, using the tractor operator's manual.
- 15.04 Perform scheduled preventive-maintenance procedures.
- 15.05 Interpret and perform operator's trouble-shooting procedures as described in the manual.
- 15.06 Keep records of tractor maintenance and services.

16.0 PERFORM MINOR REPAIR ON AN IRRIGATION SYSTEM--The student will be able to:

- 16.01 Identify the basic components of irrigation systems.
- 16.02 Differentiate various types of irrigation systems.
- 16.03 Identify state and local regulatory agencies for water management.
- 16.04 Perform minor repair on an irrigation system.

17.0 APPLY BASIC FINANCIAL-MANAGEMENT SKILLS--The student will be able to:

17.01 Complete basic financial records.
17.02 Demonstrate the use of banking procedures.
17.03 Calculate interest on loans.
17.04 Complete selected income-tax-return forms.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.05 Demonstrate a knowledge of how to make job changes appropriately.
18.06 Demonstrate acceptable personal hygiene and a professional appearance.
18.07 Apply the principles of time management, work simplification, and teamwork when performing assigned tasks.
18.08 Describe the importance of a drug-free workplace and the industry policies regarding alcohol and drug use.
18.09 Demonstrate appropriate responses to performance evaluation from employer, supervisor, or other persons in the workplace.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8103410
Course Title: Agricultural Machinery Mechanics 4
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of recordkeeping; welding; equipment operation, service, testing and maintenance; and customer-relations skills.

19.0 KEEP RECORDS--The student will be able to:

19.01 Explain the purpose and importance of keeping records.
19.02 Demonstrate procedures for keeping records of equipment maintenance and services.
19.03 Keep records on each job or project assignment.
19.04 Complete work orders, service invoices, and requisitions.
19.05 Prepare a written cost estimate of repair work and warranty claims.

20.0 WELD, BRAZE, AND CUT, USING APPROPRIATE EQUIPMENT--The student will be able to:

20.01 Set up, adjust, operate, and maintain MIG (middle inert gas) and TIG (tungsten inert gas) welding equipment.
20.02 Set up, adjust, and operate plasma cutting equipment.
20.03 Select recommended operational procedures and supplies for specific jobs.
20.04 Practice all recommended safety precautions.
20.05 Demonstrate the different welding positions.
20.06 Cut and pierce metals, using oxyacetylene and plasma.
20.07 Braze metals.
20.08 Apply hard-surface alloys.
20.09 Store welding equipment and supplies according to the recommended storage procedures.

21.0 OPERATE, SERVICE, TEST, AND MAINTAIN AGRICULTURAL MACHINERY AND EQUIPMENT--The student will be able to:

21.01 Operate and adjust agricultural machinery and equipment that are used in the local area, according to the operator's manuals, such as the following:
  a. agricultural wheel-type tractors
  b. planting equipment
  c. primary and secondary tillage equipment
  d. pesticide-application equipment
  e. harvesting equipment
  f. fertilization equipment

21.02 Remove, clean, test, repair, and reinstall parts of machinery and equipment, using repair manuals.
21.03 Service machinery, using service manuals.
21.04 Follow safety precautions when operating, servicing, and maintaining machines and equipment.

22.0 DEMONSTRATE POSITIVE CUSTOMER-RELATIONS SKILLS--The student will be able to:

22.01 Exercise self-control.
22.02 Identify and demonstrate appropriate responses to criticism.
22.03 Explain the effects of positive human-relations skills on success in the business.
22.04 Demonstrate respect for people and property.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8103420
Course Title: Agricultural Machinery Mechanics 5
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of service, repair and maintenance of the following: the lubrication system; the cooling system; the intake, exhaust, and turbo-charged systems; the fuel-delivery system; and the brake system.

23.0 DIAGNOSE, SERVICE, AND REPAIR THE LUBRICATION SYSTEM--The student will be able to:

23.01 Change oil filters.
23.02 Check and change oils and other lubricants in engines.
23.03 Diagnose and replace damaged or worn components of the system.

24.0 DIAGNOSE, SERVICE, REPAIR, AND MAINTAIN THE COOLING SYSTEM--The student will be able to:

24.01 Test coolant.
24.02 Flush and clean the system.
24.03 Test and replace parts of the system.
24.04 Adjust parts of the system for proper operation.

25.0 DIAGNOSE, SERVICE, AND REPAIR THE INTAKE, EXHAUST, AND TURBO-CHARGED SYSTEMS--The student will be able to:

25.01 Troubleshoot the intake, exhaust, and turbo-charged systems, using recommended diagnostic equipment.
25.02 Repair and replace parts of the systems.
25.03 Service and adjust the systems for proper operation.

26.0 DIAGNOSE, SERVICE, AND REPAIR THE FUEL-DELIVERY SYSTEM, USING SERVICE MANUALS--The student will be able to:

26.01 Remove, clean, rebuild, and reinstall carburetors.
26.02 Bleed the diesel-fuel system.
26.03 Remove and reinstall a diesel-fuel-injection pump, according to the manufacturer's specifications.
26.05 Replace components of the fuel system.
26.06 Service and adjust parts of the fuel system for proper operation.

27.0 DIAGNOSE, SERVICE, REPAIR, AND MAINTAIN THE BRAKE SYSTEM--The student will be able to:

27.01 Drain, refill, and adjust the brake system.

27.02 Test brake-system components, using recommended diagnostic equipment.
27.03 Repair and replace parts of the system.
27.04 Service and adjust the system for proper operation.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8103430
Course Title: Agricultural Machinery Mechanics 6
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of service, repair and maintenance of the following: internal-combustion engines; electrical system; transmission system; hydraulic system; and final-drive system; and business management skills.

28.0 DIAGNOSE, SERVICE, AND REPAIR INTERNAL-COMBUSTION ENGINES--The student will be able to:

28.01 Troubleshoot components of the engine, using recommended diagnostic equipment.
28.02 Repair and replace components of the basic engine, using repair manuals.
28.03 Service and adjust all parts of the engine for proper operation.

29.0 DIAGNOSE, SERVICE, AND REPAIR THE ELECTRICAL SYSTEM, USING SERVICE MANUALS--The student will be able to:

29.01 Troubleshoot the electrical system, using recommended diagnostic equipment.
29.02 Repair and replace components of the electrical system.
29.03 Service and adjust all parts of the system for proper operation.

30.0 DIAGNOSE, SERVICE, AND REPAIR TRANSMISSION SYSTEMS--The student will be able to:

30.01 Troubleshoot transmission components, using recommended diagnostic equipment.
30.02 Repair and replace parts of transmission systems.
30.03 Service and adjust parts of different transmission systems for proper operation.

31.0 DIAGNOSE, SERVICE, REPAIR, AND MAINTAIN THE HYDRAULIC SYSTEM--The student will be able to:

31.01 Change filters and drain, flush, and refill the hydraulic system.
31.02 Troubleshoot hydraulic-system components, using recommended diagnostic equipment.
31.03 Repair and replace parts of the system.
31.04 Service and adjust the system for proper operation.

32.0 DIAGNOSE, SERVICE, AND REPAIR THE FINAL-DRIVE SYSTEMS--The student will be able to:

32.01 Diagnose the final-drive systems, using recommended diagnostic equipment.
32.02 Repair and replace parts of the systems.
32.03 Service and adjust the systems for proper operation.

33.0 APPLY BUSINESS-MANAGEMENT SKILLS AND IDENTIFY APPROPRIATE LEGAL DOCUMENTS--The student will be able to:

33.01 Identify personal/business liability and the use of liability insurance.
33.02 Identify applicable insurance requirements.
33.03 Identify and complete basic business-tax-liability forms.
33.04 Identify the requirements of greenbelt-, bluebelt-, and homestead-tax exemptions.
33.05 Interpret enterprise budgets and amortization tables.
33.06 Identify characteristics of legal documents (such as contracts, deeds, and leases).
33.07 Identify applicable land-use and zoning regulations, including a comprehensive plan.

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Florida Department of Education
INTENDED OUTCOMES

Program Title: Agricultural Machinery Operations

	Secondary	PSAV
Program Number	**8103200**	**A010204**
CIP Number	0101.020400	0101.020400
Grade Level	9-12, 30, 31	30, 31
Length	4 credits	600 hours
Certification	VOC AGRI @4	VOC AGRI @4
	AGRI @4	AGRI @2 @4
	AGRI MECH #7	AGRI MECH @7 G
	AGRICULTUR 1 @2	AGRICULTUR 1 @2
Basic-Skills Grade Level		
	Math	8
	Language	8
	Reading	8

INTENDED OUTCOMES: After successfully completing the appropriate outcomes for each occupational completion point of this program, the student will be able to perform the following:

OCCUPATIONAL COMPLETION POINT - DATA CODE A
FARM MACHINE TENDER - DOT Code 409.685-010 (CORE)

01.0 Describe the socioeconomic role of the agricultural industry.
02.0 Apply scientific and technological principles to the agricultural industry.
03.0 Practice agricultural safety.
04.0 Demonstrate the use of tools, equipment, and instruments in the agricultural industry.
05.0 Describe the principles of integrated pest management (IPM).
06.0 Describe the principles of plant and/or animal growth and reproduction.
07.0 Apply business skills and economic principles to the agricultural industry.
08.0 Explain the basic marketing processes in the agricultural industry.
09.0 Demonstrate human-relations, communications, and leadership skills.
10.0 Practice personal, equipment, and shop safety.
11.0 Select and use hand and power tools.
12.0 Install simple electrical circuits.
13.0 Demonstrate electric and gas welding.
14.0 Service and maintain small gasoline engines.
15.0 Perform preventive maintenance, checks, and services for tractors.
16.0 Perform minor repairs on an irrigation system.
17.0 Apply basic financial-management skills.
18.0 Demonstrate employability skills.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
FARM EQUIPMENT OPERATOR - OES Code 79021530

19.0 Keep records.

20.0 Practice soil conservation.
21.0 Operate, service, and maintain agricultural machinery and equipment.
22.0 Apply business-management skills and identify appropriate legal documents.
23.0 Demonstrate positive customer-relations skills.

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Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Agricultural Machinery Operations
Secondary Number: 8103200
Postsecondary Number: A010204

OCCUPATIONAL COMPLETION POINT - DATA CODE A
FARM MACHINE TENDER - DOT Code 409.685-010 (CORE)

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.
02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.

06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC THE MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.
09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

10.0 PRACTICE PERSONAL, EQUIPMENT, AND SHOP SAFETY--The student will be able to:

10.01 Identify and eliminate hazards in agricultural mechanics settings.
10.02 Observe color-coded warnings in work areas and on equipment and machinery.
10.03 Describe appropriate actions in case of fire accident, or other emergencies.
10.04 Describe personal protective equipment (PPE) and appropriate clothing.
10.05 Demonstrate safety procedures and workplace "housekeeping" practices.
10.06 Safely handle and store flammable and non-restricted chemicals.
10.07 Operate machinery and equipment according to the safety recommendations of the manufacturers.
10.08 Comply with the Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) rules and regulations.
10.09 Describe the Florida "Right-to-Know" law (as recorded in Florida Statutes, Chapter 442).

11.0 SELECT AND USE HAND AND POWER TOOLS--The student will be able to:

11.01 Identify the capabilities and limitations of hand and power tools.
11.02 Select and safely use hand and power tools.
11.03 Select and use proper PPE for hand and power tools.
11.04 Identify worn, damaged, or abused tools.
11.05 Select and demonstrate the appropriate procedures for sharpening tools.

12.0 INSTALL SIMPLE ELECTRICAL CIRCUITS--The student will be able to:

12.01 Demonstrate the principles of AC and DC circuitry.
12.02 Demonstrate series and parallel circuitry.
12.03 Explain the scientific principles of electrical systems.
12.04 Plan and install a simple wiring system.
12.05 Test electrical circuits.

13.0 DEMONSTRATE ELECTRIC AND GAS WELDING--The student will be able to:

13.01 Select and use gas welding equipment.
13.02 Select and use electric arc-welding equipment and materials.

14.0 SERVICE AND MAINTAIN SMALL GASOLINE ENGINES--The student will be able to:

14.01 Explain the scientific principles of small engines.
14.02 Identify major parts and describe the general operation of small gasoline engines (2- and 4-stroke cycle).
14.03 Practice appropriate safety precautions.
14.04 Troubleshoot and perform minor repairs on small gasoline engines.

15.0 PERFORM PREVENTIVE MAINTENANCE, CHECKS, AND SERVICES FOR TRACTORS--The student will be able to:

15.01 Explain the scientific principles of hydraulic and transmission systems.
15.02 Perform daily operator maintenance checks for tractors.
15.03 Determine the preventive-maintenance procedures, using the tractor operator's manual.
15.04 Perform scheduled preventive-maintenance procedures.
15.05 Interpret and perform operator's trouble-shooting procedures as described in the manual.
15.06 Keep records of tractor maintenance and services.

16.0 PERFORM MINOR REPAIR ON AN IRRIGATION SYSTEM--The student will be able to:

16.01 Identify the basic components of irrigation systems.
16.02 Differentiate various types of irrigation systems.
16.03 Identify state and local regulatory agencies for water management.
16.04 Perform minor repair on an irrigation system.

17.0 APPLY BASIC FINANCIAL-MANAGEMENT SKILLS--The student will be able to:

17.01 Complete basic financial records.
17.02 Demonstrate the use of banking procedures.
17.03 Calculate interest on loans.
17.04 Complete selected income-tax-return forms.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct group meetings, using parliamentary procedures and public-speaking skills.
18.02 Identify the documents that are required for a job application.
18.03 Complete a job application form.
18.04 Demonstrate competencies in job-interview techniques.
18.05 Demonstrate a knowledge of how to make job changes appropriately.
18.06 Demonstrate acceptable personal hygiene and a professional appearance.
18.07 Apply the principles of time management, work simplification, and teamwork when performing assigned tasks.
18.08 Describe the importance of a drug-free workplace and the industry policies regarding alcohol and drug use.
18.09 Demonstrate appropriate responses to performance evaluation from employer, supervisor, or other persons in the workplace.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
FARM EQUIPMENT OPERATOR - OES Code 79021530

19.0 KEEP RECORDS--The student will be able to:

19.01 Explain the purpose and importance of keeping records.
19.02 Demonstrate procedures for keeping records of equipment operation, maintenance, and services.
19.03 Keep records on each job or project assignment.

20.0 PRACTICE SOIL CONSERVATION--The student will be able to:

20.01 Determine soil conditions such as textures, moisture, and structure.
20.02 Identify the proper conditions of soil for machine operations.
20.03 Practice soil conservation according to a farm plan.

21.0 OPERATE, SERVICE, AND MAINTAIN AGRICULTURAL MACHINERY AND EQUIPMENT--The student will be able to:

21.01 Follow safety precautions when operating, servicing, and maintaining machinery and equipment.
21.02 Operate and adjust agricultural machinery and equipment used in the local area such as the following, according to the operator's manuals:
    a. agricultural wheel-type tractors
    b. planting equipment
    c. primary and secondary tillage equipment
    d. pesticide-application equipment
    e. harvesting equipment
    f. fertilization equipment
21.03 Service machinery, using service manuals.

22.0 APPLY BUSINESS-MANAGEMENT SKILLS AND IDENTIFY APPROPRIATE LEGAL DOCUMENTS--The student will be able to:

22.01 Identify personal/business liability and the use of liability insurance.
22.02 Identify applicable insurance requirements.
22.03 Identify and complete basic business-tax liability forms.
22.04 Identify the requirements of eligibility for greenbelt, bluebelt, and homestead-tax exemptions.
22.05 Interpret enterprise budgets and amortization tables.
22.06 Identify characteristics of legal documents (such as contracts, deeds, and leases).
22.07 Identify applicable land-use and zoning regulations, including a comprehensive plan.

23.0 DEMONSTRATE POSITIVE CUSTOMER-RELATIONS SKILLS--The student will be able to:

23.01 Exercise self-control.
23.02 Identify and demonstrate appropriate responses to criticism.
23.03 Explain the effects of positive human-relations skills on success in the business.
23.04 Demonstrate respect for people and property.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106810
Course Title: Agriscience Foundations I
Course Credit: 1

COURSE DESCRIPTION:

This course was developed as a core and is designed to develop competencies in the areas of agricultural history; global importance of agriculture; career opportunities; applied scientific and technological concepts; ecosystems; agricultural safety; principles of integrated pest management; principles of plant and animal growth; economic principles; agricultural marketing; and human-relations skills.

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.

02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.

09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8103120
Course Title: Agricultural Mechanics 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of safety; selection and use of tools; electrical circuits; and employability skills.

10.0 PRACTICE PERSONAL, EQUIPMENT, AND SHOP SAFETY--The student will be able to:

10.01 Identify and eliminate hazards in agricultural mechanics settings.
10.02 Observe color-coded warnings in work areas and on equipment and machinery.
10.03 Describe appropriate actions in case of fire accident, or other emergencies.
10.04 Describe personal protective equipment (PPE) and appropriate clothing.
10.05 Demonstrate safety procedures and workplace "housekeeping" practices.
10.06 Safely handle and store flammable and non-restricted chemicals.
10.07 Operate machinery and equipment according to the safety recommendations of the manufacturers.
10.08 Comply with the Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) rules and regulations.
10.09 Describe the Florida "Right-to-Know" law (as recorded in Florida Statutes, Chapter 442).

11.0 SELECT AND USE HAND AND POWER TOOLS--The student will be able to:

11.01 Identify the capabilities and limitations of hand and power tools.
11.02 Select and safely use hand and power tools.
11.03 Select and use proper PPE for hand and power tools.
11.04 Identify worn, damaged, or abused tools.
11.05 Select and demonstrate the appropriate procedures for sharpening tools.

12.0 INSTALL SIMPLE ELECTRICAL CIRCUITS--The student will be able to:

12.01 Demonstrate the principles of AC and DC circuitry.
12.02 Demonstrate series and parallel circuitry.
12.03 Explain the scientific principles of electrical systems.
12.04 Plan and install a simple wiring system.
12.05 Test electrical circuits.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct group meetings, using parliamentary procedures and public-speaking skills.
18.02 Identify the documents that are required for a job application.
18.03 Complete a job application form.
18.04 Demonstrate competencies in job-interview techniques.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8103130
Course Title: Agricultural Mechanics 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of welding; small gasoline engine service and repair; preventative maintenance procedures; irrigation system repair; financial management skills and employability skills.

13.0 DEMONSTRATE ELECTRIC AND GAS WELDING--The student will be able to:

13.01 Select and use gas welding equipment.
13.02 Select and use electric arc-welding equipment and materials.

14.0 SERVICE AND MAINTAIN SMALL GASOLINE ENGINES--The student will be able to:

14.01 Explain the scientific principles of small engines.
14.02 Identify major parts and describe the general operation of small gasoline engines (2- and 4-stroke cycle).
14.03 Practice appropriate safety precautions.
14.04 Troubleshoot and perform minor repairs on small gasoline engines.

15.0 PERFORM PREVENTIVE MAINTENANCE, CHECKS, AND SERVICES FOR TRACTORS--The student will be able to:

15.01 Explain the scientific principles of hydraulic and transmission systems.
15.02 Perform daily operator maintenance checks for tractors.
15.03 Determine the preventive-maintenance procedures, using the tractor operator's manual.
15.04 Perform scheduled preventive-maintenance procedures.
15.05 Interpret and perform operator's trouble-shooting procedures as described in the manual.
15.06 Keep records of tractor maintenance and services.

16.0 PERFORM MINOR REPAIR ON AN IRRIGATION SYSTEM--The student will be able to:

16.01 Identify the basic components of irrigation systems.
16.02 Differentiate various types of irrigation systems.
16.03 Identify state and local regulatory agencies for water management.
16.04 Perform minor repair on an irrigation system.

17.0 APPLY BASIC FINANCIAL-MANAGEMENT SKILLS--The student will be able to:

17.01 Complete basic financial records.
17.02 Demonstrate the use of banking procedures.
17.03 Calculate interest on loans.
17.04 Complete selected income-tax-return forms.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

16.05 Demonstrate a knowledge of how to make job changes appropriately.
18.06 Demonstrate acceptable personal hygiene and a professional appearance.
18.07 Apply the principles of time management, work simplification, and teamwork when performing assigned tasks.
18.08 Describe the importance of a drug-free workplace and the industry policies regarding alcohol and drug use.
18.09 Demonstrate appropriate responses to performance evaluation from employer, supervisor, or other persons in the workplace.

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Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8103210
Course Title: Agricultural Machinery Operations 4
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of recordkeeping; soil conservation; operation, service and maintenance of machinery and equipment; business management skills; and customer relations.

19.0 KEEP RECORDS--The student will be able to:

19.01 Explain the purpose and importance of keeping records.
19.02 Demonstrate procedures for keeping records of equipment operation, maintenance, and services.
19.03 Keep records on each job or project assignment.

20.0 PRACTICE SOIL CONSERVATION--The student will be able to:

20.01 Determine soil conditions such as textures, moisture, and structure.
20.02 Identify the proper conditions of soil for machine operations.
20.03 Practice soil conservation according to a farm plan.

21.0 OPERATE, SERVICE, AND MAINTAIN AGRICULTURAL MACHINERY AND EQUIPMENT--The student will be able to:

21.01 Follow safety precautions when operating, servicing, and maintaining machinery and equipment.
21.02 Operate and adjust agricultural machinery and equipment used in the local area such as the following, according to the operator's manuals:
  a. agricultural wheel-type tractors
  b. planting equipment
  c. primary and secondary tillage equipment
  d. pesticide-application equipment
  e. harvesting equipment
  f. fertilization equipment
21.03 Service machinery, using service manuals.

22.0 APPLY BUSINESS-MANAGEMENT SKILLS AND IDENTIFY APPROPRIATE LEGAL DOCUMENTS--The student will be able to:

22.01 Identify personal/business liability and the use of liability insurance.
22.02 Identify applicable insurance requirements.
22.03 Identify and complete basic business-tax liability forms.
22.04 Identify the requirements of eligibility for greenbelt, bluebelt, and homestead-tax exemptions.

22.05 Interpret enterprise budgets and amortization tables.
22.06 Identify characteristics of legal documents (such as contracts, deeds, and leases).
22.07 Identify applicable land-use and zoning regulations, including a comprehensive plan.

23.0 DEMONSTRATE POSITIVE CUSTOMER-RELATIONS SKILLS--The student will be able to:

23.01 Exercise self-control.
23.02 Identify and demonstrate appropriate responses to criticism.
23.03 Explain the effects of positive human-relations skills on success in the business.
23.04 Demonstrate respect for people and property.

July 1997

Florida Department of Education
INTENDED OUTCOMES

Program Title: Diversified Agricultural Mechanics

	Secondary	PSAV
Program Number	**8103300**	**A010203**
CIP Number	0101.020310	0101.020310
Grade Level	9-12, 30, 31	30, 31
Length	4 credits	600 hours
Certification	VOC AGRI @4	VOC AGRI @4
	AGRI @4	AGRI @2 @4
	AGRI MECH #7	AGRI MECH @7 G
	AGRICULTUR 1 @2	AGRICULTUR 1 @2
Basic-Skills Grade Level		
	Math	8
	Language	8
	Reading	8

INTENDED OUTCOMES: After successfully completing the appropriate outcomes for each occupational completion point of this program, the student will be able to perform the following:

OCCUPATIONAL COMPLETION POINT - DATA CODE A
FARM MACHINE TENDER - DOT Code 409.685-010 (CORE)

01.0 Describe the socioeconomic role of the agricultural industry.
02.0 Apply scientific and technological principles to the agricultural industry.
03.0 Practice agricultural safety.
04.0 Demonstrate the use of tools, equipment, and instruments in the agricultural industry.
05.0 Describe the principles of integrated pest management (IPM).
06.0 Describe the principles of plant and/or animal growth and reproduction.
07.0 Apply business skills and economic principles to the agricultural industry.
08.0 Explain the basic marketing processes in the agricultural industry.
09.0 Demonstrate human-relations, communications, and leadership skills.
10.0 Practice personal, equipment, and shop safety.
11.0 Select and use hand and power tools.
12.0 Install simple electrical circuits.
13.0 Demonstrate electric and gas welding.
14.0 Service and maintain small gasoline engines.
15.0 Perform preventive maintenance, checks, and services for tractors.
16.0 Perform minor repairs on an irrigation system.
17.0 Apply basic financial-management skills.
18.0 Demonstrate employability skills.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
FARM EQUIPMENT MECHANIC I - DOT Code 624-281.010

19.0 Operate and maintain agricultural tools and equipment.

20.0 Plan, draw, and construct a project.
21.0 Prepare and finish surfaces.
22.0 Replace simple electric motors, controls, and sensing devices.
23.0 Plan, repair, and maintain a basic irrigation system.
24.0 Perform basic plumbing procedures.
25.0 Mix and pour concrete and use masonry materials.
26.0 Weld, braze, and cut, using appropriate equipment.
27.0 Construct and maintain agricultural structures.
28.0 Apply business-management skills and identify appropriate legal documents.
29.0 Demonstrate positive customer-relations skills.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Diversified Agricultural Mechanics
Secondary Number: 8103300
Postsecondary Number: A010203

OCCUPATIONAL COMPLETION POINT - DATA CODE A
FARM MACHINE TENDER - DOT Code 409.685-010 (CORE)

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.
02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.

06.05 Extract pertinent information from a fertilizer label.

06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.

06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).

06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.

07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.

07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).

07.04 Select and use computer applications.

07.05 Analyze and interpret data.

07.06 Keep and maintain supervised agricultural experience (SAE) records.

07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC THE MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.

08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.

09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.

09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.

09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.

09.05 Conduct small, informal, formal, and group meetings.

09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

10.0 PRACTICE PERSONAL, EQUIPMENT, AND SHOP SAFETY--The student will be able to:

10.01 Identify and eliminate hazards in agricultural mechanics settings.
10.02 Observe color-coded warnings in work areas and on equipment and machinery.
10.03 Describe appropriate actions in case of fire accident, or other emergencies.
10.04 Describe personal protective equipment (PPE) and appropriate clothing.
10.05 Demonstrate safety procedures and workplace "housekeeping" practices.
10.06 Safely handle and store flammable and non-restricted chemicals.
10.07 Operate machinery and equipment according to the safety recommendations of the manufacturers.
10.08 Comply with the Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) rules and regulations.
10.09 Describe the Florida "Right-to-Know" law (as recorded in Florida Statutes, Chapter 442).

11.0 SELECT AND USE HAND AND POWER TOOLS--The student will be able to:

11.01 Identify the capabilities and limitations of hand and power tools.
11.02 Select and safely use hand and power tools.
11.03 Select and use proper PPE for hand and power tools.
11.04 Identify worn, damaged, or abused tools.
11.05 Select and demonstrate the appropriate procedures for sharpening tools.

12.0 INSTALL SIMPLE ELECTRICAL CIRCUITS--The student will be able to:

12.01 Demonstrate the principles of AC and DC circuitry.
12.02 Demonstrate series and parallel circuitry.
12.03 Explain the scientific principles of electrical systems.
12.04 Plan and install a simple wiring system.
12.05 Test electrical circuits.

13.0 DEMONSTRATE ELECTRIC AND GAS WELDING--The student will be able to:

13.01 Select and use gas welding equipment.
13.02 Select and use electric arc-welding equipment and materials.

14.0 SERVICE AND MAINTAIN SMALL GASOLINE ENGINES--The student will be able to:

14.01 Explain the scientific principles of small engines.
14.02 Identify major parts and describe the general operation of small gasoline engines (2- and 4-stroke cycle).
14.03 Practice appropriate safety precautions.
14.04 Troubleshoot and perform minor repairs on small gasoline engines.

15.0 PERFORM PREVENTIVE MAINTENANCE, CHECKS, AND SERVICES FOR TRACTORS--The student will be able to:

15.01 Explain the scientific principles of hydraulic and transmission systems.
15.02 Perform daily operator maintenance checks for tractors.
15.03 Determine the preventive-maintenance procedures, using the tractor operator's manual.
15.04 Perform scheduled preventive-maintenance procedures.
15.05 Interpret and perform operator's trouble-shooting procedures as described in the manual.
15.06 Keep records of tractor maintenance and services.

16.0 PERFORM MINOR REPAIR ON AN IRRIGATION SYSTEM--The student will be able to:

16.01 Identify the basic components of irrigation systems.
16.02 Differentiate various types of irrigation systems.
16.03 Identify state and local regulatory agencies for water management.
16.04 Perform minor repair on an irrigation system.

17.0 APPLY BASIC FINANCIAL-MANAGEMENT SKILLS--The student will be able to:

17.01 Complete basic financial records.
17.02 Demonstrate the use of banking procedures.
17.03 Calculate interest on loans.
17.04 Complete selected income-tax-return forms.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct group meetings, using parliamentary procedures and public-speaking skills.
18.02 Identify the documents that are required for a job application.
18.03 Complete a job application form.
18.04 Demonstrate competencies in job-interview techniques.
18.05 Demonstrate a knowledge of how to make job changes appropriately.
18.06 Demonstrate acceptable personal hygiene and a professional appearance.
18.07 Apply the principles of time management, work simplification, and teamwork when performing assigned tasks.
18.08 Describe the importance of a drug-free workplace and the industry policies regarding alcohol and drug use.
18.09 Demonstrate appropriate responses to performance evaluation from employer, supervisor, or other persons in the workplace.

OCCUPATIONAL COMPLETION POINT - DATA B

FARM EQUIPMENT MECHANIC I - DOT Code 624-281.010

19.0 OPERATE AND MAINTAIN AGRICULTURAL TOOLS AND EQUIPMENT--The student will be able to:

19.01 Set up, adjust, and operate selected agricultural equipment according to the operator's manual.

19.02 Maintain and repair selected agricultural tools and equipment, using repair manuals.
19.03 Prepare equipment for storage.
19.04 Keep records of equipment maintenance and services.

20.0 PLAN, DRAW, AND CONSTRUCT A PROJECT--The student will be able to:

20.01 Plan and sketch a project.
20.02 Design and draw a project using drawing instruments and/or computer-assisted design (CAD) software.
20.03 Calculate a bill of materials.
20.04 Construct a project.

21.0 PREPARE AND FINISH SURFACES--The student will be able to:

21.01 Identify and select appropriate finishes (such as paint, varnish, and stain).
21.02 Repair worn or damaged surfaces, using fillers, caulking, and sealers.
21.03 Prepare surfaces and apply finishes.

22.0 REPLACE SIMPLE ELECTRIC MOTORS, CONTROLS, AND SENSING DEVICES--The student will be able to:

22.01 Identify different types of electric motors.
22.02 Differentiate various types of controls.
22.03 Replace electric motors, controls, and sensing devices.

23.0 PLAN, REPAIR, AND MAINTAIN A BASIC IRRIGATION SYSTEM--The student will be able to:

23.01 Determine irrigation requirements.
23.02 Plan and lay out an irrigation system, using computer applications.
23.03 Repair and maintain an irrigation system.

24.0 PERFORM BASIC PLUMBING PROCEDURES--The student will be able to:

24.01 Identify and select plumbing materials and tools.
24.02 Plan and construct a simple water-delivery system.
24.03 Troubleshoot and perform minor plumbing repairs.
24.04 Locate the state and local codes and standards and describe the importance of complying with them.

25.0 MIX AND POUR CONCRETE AND USE MASONRY MATERIALS--The student will be able to:

25.01 Calculate concrete and other materials for a masonry project.
25.02 Prepare forms; mix and pour concrete.
25.03 Lay concrete blocks and/or bricks.

26.0 WELD, BRAZE, AND CUT, USING APPROPRIATE EQUIPMENT--The student will be able to:

26.01 Set up, adjust, operate, and maintain MIG (middle inert gas) and TIG (tungsten inert gas) welding equipment.
26.02 Set up, adjust, and operate plasma cutting equipment.
26.03 Select recommended operational procedures and supplies for specific jobs.
26.04 Practice all recommended safety precautions.
26.05 Demonstrate the different welding positions.
26.06 Cut and pierce metals, using oxyacetylene and plasma.
26.07 Braze metals.
26.08 Apply hard-surface alloys.
26.09 Store welding equipment and supplies according to the recommended storage procedures.
26.10 Locate the state and local codes and standards and describe the importance of complying with them.

27.0 CONSTRUCT AND MAINTAIN AGRICULTURAL STRUCTURES--The student will be able to:

27.01 Read and interpret basic construction plans.
27.02 Lay out an agricultural structure for construction.
27.03 Demonstrate basic carpentry construction and procedures.
27.04 Construct a fence.
27.05 Maintain and repair agricultural structures.

28.0 APPLY BUSINESS-MANAGEMENT SKILLS AND IDENTIFY APPROPRIATE LEGAL DOCUMENTS--The student will be able to:

28.01 Identify personal/business liability and the use of liability insurance.
28.02 Identify applicable insurance requirements.
28.03 Identify and complete basic business-tax-liability forms.
28.04 Identify requirements of eligibility for greenbelt, bluebelt, and homestead tax exemptions.
28.05 Interpret enterprise budgets and amortization tables.
28.06 Identify characteristics of legal documents (such as contracts, deeds, and leases).
28.07 Identify applicable land-use and zoning regulations, including a comprehensive plan.

29.0 DEMONSTRATE POSITIVE CUSTOMER-RELATIONS SKILLS--The student will be able to:

29.01 Exercise self-control.
29.02 Identify and demonstrate appropriate responses to criticism.
29.03 Explain the effects of positive human-relations skills on success in the business.
29.04 Demonstrate respect for people and property.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106810
Course Title: Agriscience Foundations I
Course Credit: 1

COURSE DESCRIPTION:

This course was developed as a core and is designed to develop competencies in the areas of agricultural history; global importance of agriculture; career opportunities; applied scientific and technological concepts; ecosystems; agricultural safety; principles of integrated pest management; principles of plant and animal growth; economic principles; agricultural marketing; and human-relations skills.

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

- 01.01 Prepare a report on the history of the agricultural industry.
- 01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
- 01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
- 01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

- 02.01 Discuss the importance of scientific classification in agriculture.
- 02.02 Use the scientific method to solve problems in agriculture.
- 02.03 Explain the use of genetics in agriculture, including probability applications.
- 02.04 Analyze the impact of recent technology on the agricultural industry.
- 02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
- 02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
- 02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
- 02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
- 02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
- 02.10 Explain the interaction of one natural resource on another.
- 02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.

02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

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06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.

09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8103120
Course Title: Agricultural Mechanics 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of safety; selection and use of tools; electrical circuits; and employability skills.

10.0 PRACTICE PERSONAL, EQUIPMENT, AND SHOP SAFETY--The student will be able to:

10.01 Identify and eliminate hazards in agricultural mechanics settings.
10.02 Observe color-coded warnings in work areas and on equipment and machinery.
10.03 Describe appropriate actions in case of fire accident, or other emergencies.
10.04 Describe personal protective equipment (PPE) and appropriate clothing.
10.05 Demonstrate safety procedures and workplace "housekeeping" practices.
10.06 Safely handle and store flammable and non-restricted chemicals.
10.07 Operate machinery and equipment according to the safety recommendations of the manufacturers.
10.08 Comply with the Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) rules and regulations.
10.09 Describe the Florida "Right-to-Know" law (as recorded in Florida Statutes, Chapter 442).

11.0 SELECT AND USE HAND AND POWER TOOLS--The student will be able to:

11.01 Identify the capabilities and limitations of hand and power tools.
11.02 Select and safely use hand and power tools.
11.03 Select and use proper PPE for hand and power tools.
11.04 Identify worn, damaged, or abused tools.
11.05 Select and demonstrate the appropriate procedures for sharpening tools.

12.0 INSTALL SIMPLE ELECTRICAL CIRCUITS--The student will be able to:

12.01 Demonstrate the principles of AC and DC circuitry.
12.02 Demonstrate series and parallel circuitry.
12.03 Explain the scientific principles of electrical systems.
12.04 Plan and install a simple wiring system.
12.05 Test electrical circuits.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct group meetings, using parliamentary procedures and public-speaking skills.
18.02 Identify the documents that are required for a job application.
18.03 Complete a job application form.
18.04 Demonstrate competencies in job-interview techniques.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8103130
Course Title: Agricultural Mechanics 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of welding; small gasoline engine service and repair; preventative maintenance procedures; irrigation system repair; financial management skills and employability skills.

13.0 DEMONSTRATE ELECTRIC AND GAS WELDING--The student will be able to:

- 13.01 Select and use gas welding equipment.
- 13.02 Select and use electric arc-welding equipment and materials.

14.0 SERVICE AND MAINTAIN SMALL GASOLINE ENGINES--The student will be able to:

- 14.01 Explain the scientific principles of small engines.
- 14.02 Identify major parts and describe the general operation of small gasoline engines (2- and 4-stroke cycle).
- 14.03 Practice appropriate safety precautions.
- 14.04 Troubleshoot and perform minor repairs on small gasoline engines.

15.0 PERFORM PREVENTIVE MAINTENANCE, CHECKS, AND SERVICES FOR TRACTORS--The student will be able to:

- 15.01 Explain the scientific principles of hydraulic and transmission systems.
- 15.02 Perform daily operator maintenance checks for tractors.
- 15.03 Determine the preventive-maintenance procedures, using the tractor operator's manual.
- 15.04 Perform scheduled preventive-maintenance procedures.
- 15.05 Interpret and perform operator's trouble-shooting procedures as described in the manual.
- 15.06 Keep records of tractor maintenance and services.

16.0 PERFORM MINOR REPAIR ON AN IRRIGATION SYSTEM--The student will be able to:

- 16.01 Identify the basic components of irrigation systems.
- 16.02 Differentiate various types of irrigation systems.
- 16.03 Identify state and local regulatory agencies for water management.
- 16.04 Perform minor repair on an irrigation system.

17.0 APPLY BASIC FINANCIAL-MANAGEMENT SKILLS--The student will be able to:

17.01 Complete basic financial records.
17.02 Demonstrate the use of banking procedures.
17.03 Calculate interest on loans.
17.04 Complete selected income-tax-return forms.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.05 Demonstrate a knowledge of how to make job changes appropriately.
18.06 Demonstrate acceptable personal hygiene and a professional appearance.
18.07 Apply the principles of time management, work simplification, and teamwork when performing assigned tasks.
18.08 Describe the importance of a drug-free workplace and the industry policies regarding alcohol and drug use.
18.09 Demonstrate appropriate responses to performance evaluation from employer, supervisor, or other persons in the workplace.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8103310
Course Title: Diversified Agricultural Mechanics 4
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competency in the areas of operation and maintenance of tools and equipment; project construction; electric motors replacement; irrigation systems repair and maintenance; plumbing procedures; masonry; and welding.

19.0 OPERATE AND MAINTAIN AGRICULTURAL TOOLS AND EQUIPMENT--The student will be able to:

19.01 Set up, adjust, and operate selected agricultural equipment according to the operator's manual.
19.02 Maintain and repair selected agricultural tools and equipment, using repair manuals.
19.03 Prepare equipment for storage.
19.04 Keep records of equipment maintenance and services.

20.0 PLAN, DRAW, AND CONSTRUCT A PROJECT--The student will be able to:

20.01 Plan and sketch a project.
20.02 Design and draw a project using drawing instruments and/or computer-assisted design (CAD) software.
20.03 Calculate a bill of materials.
20.04 Construct a project.

21.0 PREPARE AND FINISH SURFACES--The student will be able to:

21.01 Identify and select appropriate finishes (such as paint, varnish, and stain).
21.02 Repair worn or damaged surfaces, using fillers, caulking, and sealers.
21.03 Prepare surfaces and apply finishes.

22.0 REPLACE SIMPLE ELECTRIC MOTORS, CONTROLS, AND SENSING DEVICES--The student will be able to:

22.01 Identify different types of electric motors.
22.02 Differentiate various types of controls.
22.03 Replace electric motors, controls, and sensing devices.

23.0 PLAN, REPAIR, AND MAINTAIN A BASIC IRRIGATION SYSTEM--The student will be able to:

23.01 Determine irrigation requirements.

23.02 Plan and lay out an irrigation system, using computer applications.
23.03 Repair and maintain an irrigation system.

24.0 PERFORM BASIC PLUMBING PROCEDURES--The student will be able to:

24.01 Identify and select plumbing materials and tools.
24.02 Plan and construct a simple water-delivery system.
24.03 Troubleshoot and perform minor plumbing repairs.
24.04 Locate the state and local codes and standards and describe the importance of complying with them.

25.0 MIX AND POUR CONCRETE AND USE MASONRY MATERIALS--The student will be able to:

25.01 Calculate concrete and other materials for a masonry project.
25.02 Prepare forms; mix and pour concrete.
25.03 Lay concrete blocks and/or bricks.

26.0 WELD, BRAZE, AND CUT, USING APPROPRIATE EQUIPMENT--The student will be able to:

26.01 Set up, adjust, operate, and maintain MIG (middle inert gas) and TIG (tungsten inert gas) welding equipment.
26.02 Set up, adjust, and operate plasma cutting equipment.
26.03 Select recommended operational procedures and supplies for specific jobs.
26.04 Practice all recommended safety precautions.
26.05 Demonstrate the different welding positions.
26.06 Cut and pierce metals, using oxyacetylene and plasma.
26.07 Braze metals.
26.08 Apply hard-surface alloys.
26.09 Store welding equipment and supplies according to the recommended storage procedures.
26.10 Locate the state and local codes and standards and describe the importance of complying with them.

27.0 CONSTRUCT AND MAINTAIN AGRICULTURAL STRUCTURES--The student will be able to:

27.01 Read and interpret basic construction plans.
27.02 Lay out an agricultural structure for construction.
27.03 Demonstrate basic carpentry construction and procedures.
27.04 Construct a fence.
27.05 Maintain and repair agricultural structures.

28.0 APPLY BUSINESS-MANAGEMENT SKILLS AND IDENTIFY APPROPRIATE LEGAL DOCUMENTS--The student will be able to:

28.01 Identify personal/business liability and the use of liability insurance.
28.02 Identify applicable insurance requirements.
28.03 Identify and complete basic business-tax-liability forms.

28.04 Identify requirements of eligibility for greenbelt, bluebelt, and homestead tax exemptions.
28.05 Interpret enterprise budgets and amortization tables.
28.06 Identify characteristics of legal documents (such as contracts, deeds, and leases).
28.07 Identify applicable land-use and zoning regulations, including a comprehensive plan.

29.0 DEMONSTRATE POSITIVE CUSTOMER-RELATIONS SKILLS--The student will be able to:

29.01 Exercise self-control.
29.02 Identify and demonstrate appropriate responses to criticism.
29.03 Explain the effects of positive human-relations skills on success in the business.
29.04 Demonstrate respect for people and property.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Agricultural Production Technology
Occupational Area:	Agriculture
	PSV
CIP Number	0102.010100
Grade Level	College Credits
Length	AS Degree
Certification	

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment as farm managers (71005508), production managers, general managers, farm (180.167-018), farmers, general (411.161-010), managers, production (180.161-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, instruction that prepares individuals to manage land, water, machinery, financing, crops and/or livestock, labor and facilities as well as make contracts, manage taxes, keep records, analyze records and technical reports, and demonstrate leadership, employability, communication and human relations skills.

II. **LABORATORY ACTIVITIES**: Agricultural land laboratory and shop activities are an integral part of this program including crop production equipment, livestock production equipment, mechanics' tools, facility construction and maintenance tools, and chemical application equipment.

III. **SPECIAL NOTE**: National Postsecondary Agricultural Student Organization is the appropriate vocational student organization for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Planned and supervised occupational activities may be provided through directed laboratory experience, practicum or cooperative experience. Whenever the cooperative method of instruction is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks which are relevant to the occupation which the student has chosen as a career goal. The student must receive compensation for work performed.

The typical length of this program for the average achieving student is an associate degree. The standard credit hour length for this program is 64 hours.

IV. **INTENDED OUTCOMES**: After successfully completing this program, the student will be able to:

01.0 Obtain and dispose of an agricultural enterprise.
02.0 Manage and supervise labor.
03.0 Manage crops.
04.0 Manage livestock.
05.0 Manage machinery and equipment.
06.0 Manage facilities.
07.0 Select sources and methods of financing the operation.
08.0 Keep and analyze financial, production and personnel records.
09.0 Market crops/livestock.
10.0 Interpret technical information and incorporate it into managerial practices.
11.0 Integrate state and federal regulations into the operation.
12.0 Demonstrate leadership, communication, employability and human relations skills.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title:	Agricultural Production Technology
Secondary Number:	
Postsecondary Number:	0102.020100

01.0 OBTAIN AND DISPOSE OF AGRICULTURAL ENTERPRISE--The student will be able to:

01.01 Determine land capability classes of farm or ranch.
01.02 List steps in obtaining title to real estate.
01.03 Determine advantage of using services of Soil Conservation Service(SCS).
01.04 Develop a farm or ranch rental/lease agreement.
01.05 Determine value of property.
01.06 Develop a will for transfer or disposal of property.

02.0 MANAGE AND SUPERVISE LABOR--The student will be able to:

02.01 Train and supervise workers.
02.02 Obtain information from workers necessary for employment.
02.03 List responsibilities and liability of employer regarding workers rights, safety and welfare.
02.04 List local, state and federal regulations regarding employment of workers.
02.05 Develop an employee work schedule.

03.0 MANAGE CROPS--The student will be able to:

03.01 Prepare a land use plan.
03.02 Determine long-range conservation practices.
03.03 Prepare soil for crops.
03.04 Select crop varieties best suited for land, market and type of farm operation.
03.05 Determine seeding/planting rate and spacing.
03.06 Calibrate and adjust planting equipment.
03.07 Plant crops.
03.08 Select appropriate cultural practices including cultivation, fertilization and irrigation.
03.09 Identify and control diseases, insects and pests.
03.10 Determine maturity of crops.
03.11 Harvest crops.
03.12 Store crops.
03.13 Determine most advantagious method of marketing crops.

04.0 MANAGE LIVESTOCK--The student will be able to:

04.01 Select and/or breed livestock.
04.02 Determine nutritional requirements and balance livestock rations.
04.03 Prepare a feeding schedule.
04.04 Determine quality of pasture range or forage.

04.05 Provide for winter rations and supplements.
04.06 Maintain pasture fertility and quality.
04.07 Develop a breeding/marketing plan for operation.
04.08 Cull unproductive animals.
04.09 Provide aid for animals with parturition problems.
04.10 Care for newborn livestock.
04.11 List causes of livestock infertility.
04.12 Provide mineral supplement for animals.
04.13 Determine most advantageous method of marketing livestock.
04.14 Transport livestock.
04.15 Identify and treat disorders, diseases and pests of livestock.

05.0 MANAGE MACHINERY AND EQUIPMENT--The student will be able to:

05.01 Assess needs for the purchases of new or replacement equipment.
05.02 Maintain oil, fuel and hydraulic levels in equipment.
05.03 Maintain tires, batteries and coolant system on all equipment and vehicles.
05.04 Operate and service small gasoline engines.
05.05 Replace hoses, belts and lines.
05.06 Cut and weld with oxy-acetylene and arc welding equipment.
05.07 Observe safety procedures when operating farm equipment.
05.08 Develop a general maintenance schedule.

06.0 MANAGE FACILITIES--The student will be able to:

06.01 Safely operate and maintain general farm shop tools and equipment.
06.02 Install and maintain electrical wiring and equipment.
06.03 Square and build a farm structure.
06.04 Determine a bill of materials for a farm construction project.
06.05 Form and pour concrete.
06.06 Build and repair fences, gates and pens.
06.07 Develop a general maintenance schedule for facilities and equipment.

07.0 SELECT SOURCES AND METHODS OF FINANCING THE OPERATION--The student will be able to:

07.01 List major sources of production credit.
07.02 List sources of credit for capital items and real estate.
07.03 Prepare a case using accepted forms for obtaining credit from farm lending institutions.

08.0 KEEP AND ANALYZE FINANCIAL, PRODUCTION AND PERSONNEL RECORDS--The student will be able to:

08.01 Keep fertilization and pesticide use records.
08.02 Keep equipment maintenance and service records.
08.03 Record cultural and production information.
08.04 Determine cost efficiency of operations.
08.05 Maintain labor and personnel records.
08.06 Prepare a farm tax return.
08.07 Prepare an annual budget

08.08 Determine credit, cash flow and investment returns.
08.09 Review sources and kinds of farm insurance.

09.0 MARKET CROPS/LIVESTOCK--The student will be able to:

09.01 Secure and interpret market information.
09.02 Select marketing channels for greatest profit.
09.03 Interpret elements of marketing agreements.
09.04 Market crops/livestock.
09.05 Provide for transportation of product to market.

10.0 INTERPRET TECHNICAL INFORMATION AND INCORPORATE IT INTO MANAGERIAL PRACTICES--The student will be able to:

10.01 Keep and maintain a file of current technical information from universities, governmental and commercial agencies.
10.02 Maintain a reference file for periodicals and other publications.
10.03 Attend seminars and workshops to update skills and knowledge.
10.04 Determine sources and advantages of using computer networking.

11.0 INTEGRATE STATE AND FEDERAL REGULATIONS INTO OPERATION--The student will be able to:

11.01 List agencies responsible for inspecting and regulating operation of product.
11.02 Secure necessary inspection certificates and registrations.
11.03 List reasons for the necessity of inspections, certifications and registrations.

12.0 DEMONSTRATE LEADERSHIP, COMMUNICATION, EMPLOYABILITY AND HUMAN RELATIONS SKILLS--The student will be able to:

12.01 Develop citizenship awareness and responsibility.
12.02 Demonstrate knowledge in organizing and conducting meetings.
12.03 Demonstrate effective communication skills.
12.04 Complete an employment application
12.05 Conduct a job search.
12.06 Demonstrate job interview skills.
12.07 Recognize appropriate work habits.
12.08 Identify associations and societies associated with occupation or profession.

July 1997

Florida Department Of Education
CURRICULUM FRAMEWORK

Program Title: Agricultural Sales And Services
Program Type: Job Preparatory
Occupational Area: Agriculture And Natural Resources
Components: N/A

	Secondary	PSAV
Program Numbers	**8116000**	**A010500**
CIP Number	0101.050100	0101.050100
Grade Level	9-12, 30, 31	30, 31
Length	3 credits	450 hours
Certification	VOC AGRI @ 4	VOC AGRI @ 4
	AGRI @ 4	AGRI @2 @4
	AGRICULTUR 1 @2	AGRICULTUR 1 @2
	¶Any AG ED G	Any AG ED G
Facility Code	203	203
VSO	FFA	PAS
Coop Method	Yes	Yes
Apprenticeship	Yes	Yes
Basic Skills		
Math		8
Language		8
Reading		8

I. **PURPOSE:** The purpose of this program is to prepare students for employment or advanced training in the agricultural sales and services industry. This program also provides supplemental training for persons previously or currently employed in the agricultural sales and services industry.

II. **PROGRAM STRUCTURE:** This program focuses on broad, transferrable skills, stresses the understanding of all aspects of the agricultural sales and services industry, and demonstrates such elements of the industry as planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues, and health, safety, and environmental issues.

At the secondary level, the Agricultural Sales and Services program consists of the following courses:

AGRICULTURAL SALES AND SERVICES COURSES - 3 secondary credits

8106810 - Agriscience Foundations 1
8116010 - Agricultural Sales and Services 2
8116020 - Agricultural Sales and Services 3

III. **SPECIAL NOTE:** The FFA (for secondary) and the the National Postsecondary Agricultural Student Organization (for postsecondary) are the appropriate vocational student organizations for providing leadership training and for reinforcing specific vocational skills.

Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Classroom, shop, and laboratory activities are an integral part of this program. These activities include instruction in the use of the safety procedures, tools, equipment, materials, and processes found in the industry. Equipment and supplies should be provided to enhance hands-on experiences for students in their chosen occupation. A generic equipment list is available for this program.

This program may be offered in postsecondary adult vocational (PSAV) courses. Vocational credit shall be awarded to the student on a transcript in accordance with Rule 6A-10.040, FAC.

The cooperative method of instruction is appropriate for this program. Whenever the cooperative method is offered, the following are required for each student: a training plan that is signed by the student, teacher, and employer,including instructional objectives and a list of on-the-job and in-school learning experiences and a workstation that reflects the equipment, skills, and tasks that are relevant to the occupation that the student has chosen as a career goal. The student must be paid for work performed.

In accordance with Rule 6A-10.040, FAC, the minimum basic-skills grade levels required for postsecondary adult vocational students to exit the program are listed before the intended outcomes for the program. These grade-level numbers correspond to grade-equivalent scores obtained on one of the state-designated basic-skills examinations. If a student does not meet the basic-skills level required for completion of the program, remediation should be provided concurrently in the System for Applied Individualization Learning (SAIL). Please refer to the Rule for exemptions.

When a secondary student with a disability is enrolled in a vocational class for which modifications to the curriculum framework have been made, the particular outcomes and student performance standards that the student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEPs. The job title for which the student is being trained must be designated in the IEP.

SCANS Competencies: To accomplish the Secretary's Commission on Achieving Necessary Skills (SCANS) competencies, instructional strategies for this program must include methods that require students to identify, organize, and use resources appropriately; to work with each other cooperatively and productively; to acquire and use information; to understand social, organizational, and technological systems; and to work with a variety of tools and equipment. Instructional strategies must also incorporate methods to improve students' personal qualities and higher-order thinking skills.

IV. **INTENDED OUTCOMES**: After successfully completing the appropriate outcomes for this program, the student will be able to:

OCCUPATIONAL COMPLETION POINT - DATA CODE A
Sales Representative, Farm and Garden Equipment and Supplies - DOT - 272.357-014

01.0 Describe the socioeconomic role of the agricultural industry.
02.0 Apply scientific and technological principles to the agricultural industry.
03.0 Practice agricultural safety.
04.0 Demonstrate the use of tools, equipment, and instruments in the agricultural industry.
05.0 Describe the principles of integrated pest management (IPM).
06.0 Describe the principles of plant and/or animal growth and reproduction.
07.0 Apply business skills and economic principles to the agricultural industry.
08.0 Explain the basic marketing processes in the agricultural industry.
09.0 Demonstrate human-relations, communications, and leadership skills.
10.0 Demonstrate an understanding of the basic concepts of agribusiness.
11.0 Operate and maintain equipment and maintain the facilities.
12.0 Handle merchandise.
13.0 Demonstrate positive customer-relations skills.
14.0 Demonstrate employability skills.
15.0 Demonstrate a knowledge of the general principles of agribusiness.
16.0 Perform agricultural business activities.
17.0 Merchandise and sell agricultural products and services.
18.0 Perform promotional activities.
19.0 Observe local, state, and federal rules and regulations.

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Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Agricultural Sales And Services
Secondary Number: 8116000
Postsecondary Number: A010501

OCCUPATIONAL COMPLETION POINT - DATA CODE A

Sales Representative, Farm and Garden Equipment and Supplies - DOT - 272.357-014

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.
02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.

06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole propriet0rship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC THE MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.
09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

10.0 DEMONSTRATE AN UNDERSTANDING OF THE BASIC CONCEPTS OF AGRIBUSINESS--The student will be able to:

10.01 Explain the following concepts:
  a. business cycle
  b. profit
  c. competition
10.02 Describe relevant ethical issues in agribusiness.

11.0 OPERATE AND MAINTAIN EQUIPMENT AND MAINTAIN THE FACILITIES--The student will be able to:

11.01 Operate and maintain the equipment appropriate to agribusiness.
11.02 Maintain grounds, walkways, and facilities.
11.03 Assemble tools and equipment, using manufacturers' manuals.
11.04 Perform routine maintenance services on agricultural equipment, using manufacturers' manuals.
11.05 Construct and repair structures, observing safety precautions.
11.06 Follow safety precautions when working with equipment.
11.07 Maintain maintenance and repair records, using the computer-application program where applicable.

12.0 HANDLE MERCHANDISE--The student will be able to:

12.01 Load and unload delivery vehicles.
12.02 Process incoming merchandise, including checking it against the invoice and returning unusable merchandise.
12.03 Store received agricultural products according to the manufacturer's specifications.
12.04 Prepare agricultural products for shipment.
12.05 Safely store flammable liquids and agricultural chemicals.
12.06 Conduct an inventory and utilize a computerized inventory-control system.
12.07 Rotate the inventory.

13.0 DEMONSTRATE POSITIVE CUSTOMER-RELATIONS SKILLS--The student will be able to:

13.01 Maintain a customer file system.
13.02 Exercise self-control.
13.03 Identify and demonstrate appropriate responses to criticism and praise.
13.04 Explain the effects of positive human relations on success in the business.
13.05 Demonstrate respect for the customer's desires and property.
13.06 Demonstrate effective telephone skills to enhance customer relations.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search and identify advanced-training opportunities and their requirements.
14.02 Calculate the employer's investment cost for an employee.
14.03 Secure information about a job, including employee benefits.
14.04 Write a resume.

14.05 Evaluate a job offer, considering various factors such as career advancement, job satisfaction, employee benefits, etc.
14.06 Demonstrate ethical and responsible practices.
14.07 Exhibit pride in the quality of work performed.
14.08 Describe the advantages of a good driving record and the ramifications of a poor driving record on employability opportunities.
14.09 Describe Florida's "Right-to-Know" Law.
14.10 Explain the importance of confidentiality in the workplace.
14.11 Demonstrate appropriate responses to performance evaluations from the employer, the supervisor, and other persons in the workplace.

15.0 DEMONSTRATE A KNOWLEDGE OF THE GENERAL PRINCIPLES OF AGRIBUSINESS--The student will be able to:

15.01 Explain the different types of record-keeping systems used in agribusiness.
15.02 Explain and differentiate between variable and fixed costs.
15.03 Identify the various types and sources of credit.
15.04 Calculate the time value of money.
15.05 Describe the decision-making process involved in purchasing capital and sales products.

16.0 PERFORM AGRICULTURAL BUSINESS ACTIVITIES--The student will be able to:

16.01 Open and close the store or facility.
16.02 Operate sales counter equipment.
16.03 Maintain business records.
16.04 Order supplies and equipment through various methods, including by catalogs and tele- and electronic-communication devices.
16.05 Calculate margins and discounts for agricultural supplies and products (e.g., cash, bulk, quantity, early season, etc.).
16.06 Label and price merchandise, considering the factors involved in pricing agricultural products and services.
16.07 Update prices on merchandise.
16.08 Code and date merchandise.
16.09 Maintain a ledger of accounts, including the calculation of interest.
16.10 Use a computer, demonstrating word-processing skills and the ability to maintain a database, produce a spreadsheet, and access an electronic network.

17.0 MERCHANDISE AND SELL AGRICULTURAL PRODUCTS AND SERVICES--The student will be able to:

17.01 Analyze marketing and pricing alternatives.
17.02 Differentiate marketing, pricing, value, and grading standards for different agricultural products.
17.03 Merchandise/display agricultural products.
17.04 Explain the purpose, benefit, and quality of the products sold.
17.05 Determine customer needs and wants.
17.06 Recommend products and services that meet the customer's needs or wants.

17.07 Demonstrate effective sales principles and techniques.
17.08 Take and fill customer orders by various means, including electronic communications.
17.09 Perform sales counter activities (e.g., processing sales transactions, completing a purchase order and an invoice, calculating state sales tax, etc.).
17.10 Follow up to ensure the quality of services provided to customers.
17.11 Provide technical assistance to customers.
17.12 Process customer complaints.

18.0 PERFORM PROMOTIONAL ACTIVITIES--The student will be able to:

18.01 Identify potential customers.
18.02 Collect and analyze market information.
18.03 Develop a plan for advertising an agricultural product or service.
18.04 Identify and participate in appropriate trade shows and demonstrations.
18.05 Make an oral presentation in a promotional meeting, utilizing visual aids.

19.0 OBSERVE LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS--The student will be able to:

19.01 Identify current basic government agricultural programs.
19.02 Maintain licensing, inspection, and government-records requirements.
19.03 Maintain state and federal tax records.
19.04 Identify the governmental and regulatory agencies related to agribusiness and explain their impact on agribusiness.
19.05 Identify the sources of technical assistance available from private and government agencies.

Program: 8116000 Agricultural Sales and Services

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106810
Course Title: Agriscience Foundations I
Course Credit: 1

COURSE DESCRIPTION:

This course was developed as a core and is designed to develop competencies in the areas of agricultural history; global importance of agriculture; career opportunities; applied scientific and technological concepts; ecosystems; agricultural safety; principles of integrated pest management; principles of plant and animal growth; economic principles; agricultural marketing; and human-relations skills.

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.

02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.

09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106010
Course Title: Agricultural Sales and Services 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the basic concepts of agribusiness; the operation and maintenance of equipment and maintenance of facilities; handling merchandise; demonstration of positive cumstomer-relations and employability skills.

10.0 DEMONSTRATE AN UNDERSTANDING OF THE BASIC CONCEPTS OF AGRIBUSINESS--The student will be able to:

- 10.01 Explain the following concepts:
  - a. business cycle
  - b. profit
  - c. competition
- 10.02 Describe relevant ethical issues in agribusiness.

11.0 OPERATE AND MAINTAIN EQUIPMENT AND MAINTAIN THE FACILITIES--The student will be able to:

- 11.01 Operate and maintain the equipment appropriate to agribusiness.
- 11.02 Maintain grounds, walkways, and facilities.
- 11.03 Assemble tools and equipment, using manufacturers' manuals.
- 11.04 Perform routine maintenance services on agricultural equipment, using manufacturers' manuals.
- 11.05 Construct and repair structures, observing safety precautions.
- 11.06 Follow safety precautions when working with equipment.
- 11.07 Maintain maintenance and repair records, using the computer-application program where applicable.

12.0 HANDLE MERCHANDISE--The student will be able to:

- 12.01 Load and unload delivery vehicles.
- 12.02 Process incoming merchandise, including checking it against the invoice and returning unusable merchandise.
- 12.03 Store received agricultural products according to the manufacturer's specifications.
- 12.04 Prepare agricultural products for shipment.
- 12.05 Safely store flammable liquids and agricultural chemicals.
- 12.06 Conduct an inventory and utilize a computerized inventory-control system.
- 12.07 Rotate the inventory.

13.0 DEMONSTRATE POSITIVE CUSTOMER-RELATIONS SKILLS--The student will be able to:

13.01 Maintain a customer file system.
13.02 Exercise self-control.
13.03 Identify and demonstrate appropriate responses to criticism and praise.
13.04 Explain the effects of positive human relations on success in the business.
13.05 Demonstrate respect for the customer's desires and property.
13.06 Demonstrate effective telephone skills to enhance customer relations.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search and identify advanced-training opportunities and their requirements.
14.02 Calculate the employer's investment cost for an employee.
14.03 Secure information about a job, including employee benefits.
14.04 Write a resume.
14.05 Evaluate a job offer, considering various factors such as career advancement, job satisfaction, employee benefits, etc.
14.06 Demonstrate ethical and responsible practices.
14.07 Exhibit pride in the quality of work performed.
14.08 Describe the advantages of a good driving record and the ramifications of a poor driving record on employability opportunities.
14.09 Describe Florida's "Right-to-Know" Law.
14.10 Explain the importance of confidentiality in the workplace.
14.11 Demonstrate appropriate responses to performance evaluations from the employer, the supervisor, and other persons in the workplace.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106020
Course Title: Agricultural Sales and Services 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the general principles of agribusiness; performing agricultural business activities; merchandising an selling agricultural products and services; performing promotional activities and local, state, and federal rules and regulations.

15.0 DEMONSTRATE A KNOWLEDGE OF THE GENERAL PRINCIPLES OF AGRIBUSINESS--The student will be able to:

15.01 Explain the different types of record-keeping systems used in agribusiness.
15.02 Explain and differentiate between variable and fixed costs.
15.03 Identify the various types and sources of credit.
15.04 Calculate the time value of money.
15.05 Describe the decision-making process involved in purchasing capital and sales products.

16.0 PERFORM AGRICULTURAL BUSINESS ACTIVITIES--The student will be able to:

16.01 Open and close the store or facility.
16.02 Operate sales counter equipment.
16.03 Maintain business records.
16.04 Order supplies and equipment through various methods, including by catalogs and tele- and electronic-communication devices.
16.05 Calculate margins and discounts for agricultural supplies and products (e.g., cash, bulk, quantity, early season, etc.).
16.06 Label and price merchandise, considering the factors involved in pricing agricultural products and services.
16.07 Update prices on merchandise.
16.08 Code and date merchandise.
16.09 Maintain a ledger of accounts, including the calculation of interest.
16.10 Use a computer, demonstrating word-processing skills and the ability to maintain a database, produce a spreadsheet, and access an electronic network.

17.0 MERCHANDISE AND SELL AGRICULTURAL PRODUCTS AND SERVICES--The student will be able to:

17.01 Analyze marketing and pricing alternatives.
17.02 Differentiate marketing, pricing, value, and grading standards for different agricultural products.
17.03 Merchandise/display agricultural products.
17.04 Explain the purpose, benefit, and quality of the products sold.

17.05 Determine customer needs and wants.

17.06 Recommend products and services that meet the customer's needs or wants.

17.07 Demonstrate effective sales principles and techniques.

17.08 Take and fill customer orders by various means, including electronic communications.

17.09 Perform sales counter activities (e.g., processing sales transactions, completing a purchase order and an invoice, calculating state sales tax, etc.).

17.10 Follow up to ensure the quality of services provided to customers.

17.11 Provide technical assistance to customers.

17.12 Process customer complaints.

18.0 PERFORM PROMOTIONAL ACTIVITIES--The student will be able to:

18.01 Identify potential customers.

18.02 Collect and analyze market information.

18.03 Develop a plan for advertising an agricultural product or service.

18.04 Identify and participate in appropriate trade shows and demonstrations.

18.05 Make an oral presentation in a promotional meeting, utilizing visual aids.

19.0 OBSERVE LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS--The student will be able to:

19.01 Identify current basic government agricultural programs.

19.02 Maintain licensing, inspection, and government-records requirements.

19.03 Maintain state and federal tax records.

19.04 Identify the governmental and regulatory agencies related to agribusiness and explain their impact on agribusiness.

19.05 Identify the sources of technical assistance available from private and government agencies.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Agritechnology
Occupational Area:	Agriculture
	Secondary
Program Numbers	**8106800**
CIP Number	0101.039901
Grade Level	9-12, 30, 31
Length	3 credits
Certification	VOC AGRI @4 AGRI @4 AGRI PROD #7 AGRICULTUR 1 @2

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment in positions in the agriculture industry, including: Farm Worker (74002504); Farmworker, Diversified Crops (407.687-010); Farm-Machine Tender (409.685-010); Farmworker, Livestock (410.664-010); Agricultural Product Salesperson; Agricultural Product Marketing Representative; Farm and Garden Supply Worker; Custom Harvest Operator; or Fertilizer Service Worker; or to provide supplemental training for persons previously or currently employed in these occupations.

This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the agriculture industry; planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues and health, safety and environmental issues.

Completers of this program will be prepared to enter advanced training and education in specialized fields of agriscience or agribusiness. They may also be employed as trainees or beginning workers in various agriscience- or agribusiness-related positions in certain businesses and industries.

The content includes, but is not limited to, instruction in livestock and crop production, processing, and marketing; agriculture sales and services; agricultural mechanics; employability skills; mathematics; basic science; biological sciences; communications; and human-relations skills.

Listed below are the courses that comprise this program when offered at the secondary level:

8106810 - Agriscience Foundations 1
8106820 - Agritechnology 1
8106830 - Agritechnology 2

II. **LABORATORY ACTIVITIES:** Agriscience laboratory activities (shops, wet labs, land labs, and greenhouses) are an integral part of this program, which includes the safe use and application of high technology equipment, such as computers and computer software, telecommunications equipment, and scientific testing and observation equipment, as well as mechanics' tools, field tools, carpentry tools, arc welders, oxyacetylene torches, tractors and field equipment, chemical applicators, power sprayers, irrigation equipment, and fire-control hand equipment.

III. **SPECIAL NOTE:** FFA is the appropriate vocational student organization for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Planned and supervised occupational activities must be provided through one or more of the following: (1) directed laboratory experience, (2) student project, (3) placement for experience, and (4) cooperative education.

Because of the production and marketing cycle of agriscience industries, this program requires individual instruction and supervision of students for the entire period beyond the 180-day school year.

The cooperative method of instruction is appropriate for this program. Whenever the cooperative method is offered, the following are required for each student: a training plan that is signed by the student, teacher, and employer,including instructional objectives and a list of on-the-job and in-school learning experiences and a workstation that reflects the equipment, skills, and tasks that are relevant to the occupation that the student has chosen as a career goal. The student must be paid for work performed.

When a secondary student with a disability is enrolled in a vocational class with modifications to the curriculum framework, the particular outcomes and student performance standards which the student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEPs. The job title for which the student is being trained must be designated in the IEP.

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01.0 Describe the socioeconomic role of the agricultural industry.
02.0 Apply scientific and technological principles to the agricultural industry.
03.0 Practice agricultural safety.
04.0 Demonstrate the use of tools, equipment and instruments in the agricultural industry.

05.0 Describe the principles of integrated pest management (IPM).
06.0 Describe the principles of plant and/or animal growth and reproduction.
07.0 Apply business skills and economic principles to the agricultural industry.
08.0 Explain the basic marketing processes in the agricultural industry.
09.0 Demonstrate human-relations, communications, and leadership skills.
10.0 Explore the scope of the agriscience industry.
11.0 Provide for proper animal health and nutrition.
12.0 Identify procedures in animal production and reproduction.
13.0 Use procedures for exhibiting and marketing animals.
14.0 Compare, select, and use plant-production systems.
15.0 Fertilize plants and crops.
16.0 Irrigate plants and crops.
17.0 Control plant pests.
18.0 Operate, maintain, and service facilities, tools, and equipment.
19.0 Describe procedures for harvesting and marketing plant materials.
20.0 Apply principles of agribusiness finance.
21.0 Demonstrate leadership, employability, communication, and human-relations skills.

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Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Agritechnology
Secondary Number: 8106800
Postsecondary Number:

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.
02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.

03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.
09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

10.0 EXPLORE THE SCOPE OF THE AGRISCIENCE INDUSTRY--The student will be able to:

10.01 Investigate career opportunities in agriscience industries (Levels I & II).
10.02 Describe training requirements for entry and advancement in agriscience careers (Levels I & II).

10.03 Identify professional organizations and trade journals in the agriscience industry.

11.0 PROVIDE FOR PROPER ANIMAL HEALTH AND NUTRITION--The student will be able to:

11.01 Recognize and describe prevention and treatment of common animal diseases, disorders, and pests (Levels I & II).
11.02 Read, interpret, and follow directions on pesticide, medication, and other additive labels.
11.03 Clean and disinfect animal equipment and facilities.
11.04 Explain proper disposal of animal waste with regards to sanitation, economics, and environmental implications.
11.05 Describe nutritional requirements of animals.
11.06 Formulate and compute least-cost feed rations.
11.07 Select growth stimulators and implants.
11.08 Determine feeding rates and methods of feeding animals.

12.0 IDENTIFY PROCEDURES IN ANIMAL PRODUCTION AND REPRODUCTION--The student will be able to:

12.01 Identify major parts of livestock and poultry anatomy.
12.02 Identify commercially important breeds of animals.
12.03 Describe desirable characteristics of breeding and market animals.
12.04 Identify wholesale cuts of beef, pork, lamb, and poultry.
12.05 Compare and select appropriate breeding methods for different agricultural enterprises.
12.06 Explain the reproductive cycles of commercially important animals.
12.07 Identify signs of animal pregnancy, parturition, and infertility.
12.08 Describe approved care for newborn animals.
12.09 Describe methods of permanent animal identification.
12.10 Describe methods of restraining, loading, handling, and transporting animals safely.

13.0 USE PROCEDURES FOR EXHIBITING AND MARKETING ANIMALS--The student will be able to:

13.01 Demonstrate the procedures for preparing, maintaining, and exhibiting commercially important animals.
13.02 Collect and interpret market reports and identify market outlets for livestock.
13.03 Compare and select appropriate marketing systems.
13.04 Determine appropriate evaluation criteria for animals.
13.05 Prepare appropriate shipping and health certificates required for exhibiting or marketing animals.

14.0 COMPARE, SELECT, AND USE PLANT PRODUCTION SYSTEMS--The student will be able to:

14.01 Compare different plant production systems.
14.02 Propagate, grow, and transplant plants.

14.03 Identify varieties of local commercial plants and field crops.
14.04 Select and prepare site and seed bed for planting.
14.05 Identify methods of pruning plants to achieve desired growth and to maintain health.
14.06 Calculate planting rate and spacing.
14.07 Operate and adjust planting equipment.

15.0 FERTILIZE PLANTS AND CROPS--The student will be able to:

15.01 Develop fertilization schedules and calculate fertilizer rates for plants; solve time, distance, area, and volume problems in agriscience.
15.02 Identify common nutrient-deficiency symptoms in plants.
15.03 Calibrate fertilization equipment and fertilize plants.
15.04 Interpret information on a fertilizer label.
15.05 Compare sources and forms of nutrients.
15.06 Determine methods of applying fertilizer materials.

16.0 IRRIGATE PLANTS AND CROPS--The student will be able to:

16.01 Recognize soil and plant conditions indicating irrigation needs and develop an irrigation schedule.
16.02 Compare and select irrigation equipment and methods.
16.03 Install, operate, maintain, and repair irrigation equipment.

17.0 CONTROL PLANT PESTS--The student will be able to:

17.01 Identify common plant pests and their damages.
17.02 Describe life cycles of insects, pests, and diseases.
17.03 Identify the procedures and requirements for obtaining a restricted-use-pesticide operator's license.
17.04 Select, mix, and apply a nonrestricted chemical according to the label and local, state, federal and EPA regulations.

18.0 OPERATE, MAINTAIN, AND SERVICE FACILITIES, TOOLS, AND EQUIPMENT--The student will be able to:

18.01 Demonstrate basic facility maintenance, installation, or repair.
18.02 Safely operate, maintain, service, and repair equipment.
18.03 Use and maintain hand tools and power equipment (e.g., power saws, welders).
18.04 Maintain and service small gasoline engines.

19.0 DESCRIBE PROCEDURES FOR HARVESTING AND MARKETING PLANT MATERIALS--The student will be able to:

19.01 Determine maturity, condition, and volume of crops to be harvested.
19.02 Describe procedures for harvesting crops.
19.03 Determine kinds and types of storage facilities for crops.
19.04 Grade, treat, pack, and/or store harvested crop.
19.05 Interpret and analyze market information.

19.06 Compare, select, and locate marketing channels and develop a marketing program.

20.0 APPLY PRINCIPLES OF AGRIBUSINESS FINANCE--The student will be able to:

20.01 Identify major sources of credit for agribusiness.
20.02 Complete a business loan application.
20.03 Explain the purposes and structures of contracts, leases, deeds, and insurance policies.
20.04 Maintain and interpret supervised agricultural experience (SAE) records (e.g., depreciation, inventory, budgets).

21.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATION, AND HUMAN-RELATIONS SKILLS--The student will be able to:

21.01 Conduct group meetings using parliamentary procedure and public-speaking skills.
21.02 Identify appropriate work and personal habits (Level I).
21.03 Identify appropriate work and personal habits (Level II).
21.04 Complete a job application.

Program: 8106800 Agritechnology

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106810
Course Title: Agriscience Foundations I
Course Credit: 1

COURSE DESCRIPTION:

This course was developed as a core and is designed to develop competencies in the areas of agricultural history; global importance of agriculture; career opportunities; applied scientific and technological concepts; ecosystems; agricultural safety; principles of integrated pest management; principles of plant and animal growth; economic principles; agricultural marketing; and human relations skills.

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.

02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.

09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106820
Course Title: Agritechnology 1
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of agriscience industry careers; prevention and treatment of livestock diseases; livestock anatomy; wholesale cuts of meat; animal reproduction and identification; animal safety; animal-health certification; plant growth; plant fertilization; safe use of pesticides; maintenance of tools and equipment; record keeping; and employability skills.

10.0 EXPLORE THE SCOPE OF THE AGRISCIENCE INDUSTRY--The student will be able to:

- 10.01 Investigate career opportunities in agriscience industries (Level I).
- 10.02 Describe training requirements for entry and advancement in agriscience careers (Level I).

14.0 COMPARE, SELECT, AND USE PLANT PRODUCTION SYSTEMS--The student will be able to:

- 14.01 Compare different plant production systems.
- 14.02 Propagate, grow, and transplant plants.
- 14.04 Select and prepare site and seed bed for planting.
- 14.05 Identify methods of pruning plants to achieve desired growth and to maintain health.

15.0 FERTILIZE PLANTS AND CROPS--The student will be able to:

- 15.04 Interpret information on a fertilizer label.
- 15.05 Compare sources and forms of nutrients.
- 15.06 Determine methods of applying fertilizer materials.

18.0 OPERATE, MAINTAIN, AND SERVICE FACILITIES, TOOLS, AND EQUIPMENT--The student will be able to:

- 18.03 Use and maintain hand tools and power equipment (e.g., power saws, welders).
- 18.04 Maintain and service small gasoline engines.

20.0 APPLY PRINCIPLES OF AGRIBUSINESS FINANCE--The student will be able to:

- 20.04 Maintain and interpret supervised agricultural experience (SAE) records (e.g., depreciation, inventory, budgets).

21.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATION, AND HUMAN-RELATIONS SKILLS--The student will be able to:

21.01 Conduct group meetings using parliamentary procedure and public-speaking skills.
21.02 Identify appropriate work and personal habits (Level I).

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106830
Course Title: Agritechnology 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of job and training requirements; professional organizations; crop identification; planting crops; fertilizer calculations and application; irrigation; pest control; harvesting, packing, and grading crops, safe equipment operation; finance; and employability skills.

10.0 EXPLORE THE SCOPE OF THE AGRISCIENCE INDUSTRY--The student will be able to:

10.01 Investigate career opportunities in agriscience industries (Level II).
10.02 Describe training requirements for entry and advancement in agriscience careers (Level II).
10.03 Identify professional organizations and trade journals in the agriscience industry.

14.0 COMPARE, SELECT, AND UTILIZE PLANT PRODUCTION SYSTEMS--The student will be able to:

14.03 Identify varieties of local commercial plants and field crops.
14.06 Calculate planting rate and spacing.
14.07 Operate and adjust planting equipment.

15.0 FERTILIZE PLANTS AND CROPS--The student will be able to:

15.01 Develop fertilization schedules and calculate fertilizer rates for plants; solve time, distance, area, and volume problems in agriscience.
15.02 Identify common nutrient-deficiency symptoms in plants.
15.03 Calibrate fertilization equipment and fertilize plants.

16.0 IRRIGATE PLANTS AND CROPS--The student will be able to:

16.01 Recognize soil and plant conditions indicating irrigation needs and develop an irrigation schedule.
16.02 Compare and select irrigation equipment and methods.
16.03 Install, operate, maintain, and repair irrigation equipment.

17.0 CONTROL PLANT PESTS--The student will be able to:

17.01 Identify common plant pests and their damages.
17.02 Describe life cycles of insects, pests, and diseases.

17.03 Identify the procedures and requirements for obtaining a restricted-use-pesticide operator's license.
17.04 Select, mix, and apply a nonrestricted chemical according to the label and local, state, federal, and EPA regulations.

18.0 OPERATE, MAINTAIN, AND SERVICE FACILITIES, TOOLS, AND EQUIPMENT--The student will be able to:

18.01 Demonstrate basic facility maintenance, installation, or repair.
18.02 Safely operate, maintain, service, and repair equipment.

19.0 DESCRIBE PROCEDURES FOR HARVESTING AND MARKETING PLANT MATERIALS--The student will be able to:

19.01 Determine maturity, condition, and volume of crops to be harvested.
19.02 Describe procedures for harvesting crops.
19.03 Determine kinds and types of storage facilities for crops.
19.04 Grade, treat, pack, and/or store harvested crop.
19.05 Interpret and analyze market information.
19.06 Compare, select, and locate marketing channels and develop a marketing program.

20.0 APPLY PRINCIPLES OF AGRIBUSINESS FINANCE--The student will be able to:

20.01 Identify major sources of credit for agribusiness.
20.02 Complete a business loan application.
20.03 Explain the purposes and structures of contracts, leases, deeds, and insurance policies.

21.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS, AND HUMAN-RELATIONS SKILLS--The student will be able to:

21.03 Identify appropriate work and personal habits (Level II).
21.04 Complete a job application.

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Florida Department of Education
CURRICULUM FRAMEWORK

Program Title: Animal Products Processing
Occupational Area: Agriculture

	Secondary	PSAV
Program Numbers	**8109100**	**A010402**
CIP Number	0101.040200	0101.040200
Grade Level	9-12, 30 ,31	30, 31
Length	3 credits	450 hours
Certification	VOC AGRI @4 AGRI @4 AG PRODUC ¶7 ¶G AGRICULTUR 1 @2	VOC AGRI @4 AGRI @2 @4 AG PRODUC @7 G AGRICULTUR 1 @2

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment as slaughters and butchers (89802688), meat grinders (521.685-214), butchers, all-round (525.684-010), meat wrappers (920.587-018), skinners (525.684-046), boners, meat (525.684-010), meat dressers (525.664-010), meat cutters (316.684-018), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, instruction that prepares individuals to slaughter, process and prepare meat for sale or distribution. Subject matter includes slaughtering, safety, hand and power tools, health and sanitation, display, packaging, grading, record keeping, legal regulations, and cutting, as well as leadership and human relations skills.

Listed below are the courses that comprise this program when offered at the secondary level:

8109110 - Animal Products Processing 1
8109120 - Animal Products Processing 2
8109130 - Animal Products Processing 3

II. **LABORATORY ACTIVITIES**: Slaughtering and meats cutting laboratory activities are an integral part of this program including the safe use of mechanics' tools, carpentry hand and portable power tools, slaughtering equipment and tools, meat cutting tools and instruments, coolers and freezers.

III. **SPECIAL NOTE**: Future Farmers of America (secondary) and the National Postsecondary Agricultural Student Organization (postsecondary) are the appropriate vocational student organizations for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Planned and supervised occupational activities must be provided through one or more of the following: (1) directed laboratory experience, (2) student projects, (3) placement for experience, (4) cooperative experience.

The cooperative method of instruction is appropriate for this program. Whenever the cooperative method is offered, the following are required for each student: a training plan that is signed by the student, teacher, and employer,including instructional objectives and a list of on-the-job and in-school learning experiences and a workstation that reflects the equipment, skills, and tasks that are relevant to the occupation that the student has chosen as a career goal. The student must be paid for work performed.

In accordance with Rule 6A-10.040, FAC., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 450 hours.

When a secondary student with a disability is enrolled in a vocational class with modifications to the curriculum framework, the particular outcomes and student performance standards which the student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEPs. The job title for which the student is being trained must be designated in the IEP.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

IV. **INTENDED OUTCOMES**: After successfully completing this program, the student will be able to:

01.0 Slaughter beef and swine animals.
02.0 Observe safety precautions.
03.0 Use and maintain hand and power cutting tools.
04.0 Sanitize facilities and equipment.
05.0 Follow legal regulations.
06.0 Sell and display meats.
07.0 Package meats.
08.0 Cut, trim and slice beef, pork and veal.
09.0 Prepare ground meats.
10.0 Inspect and grade meat.
11.0 Keep records.
12.0 Demonstrate proficiency in applying basic mathematics, science and communication skills to agriculture problem solving.
13.0 Demonstrate employability skills.

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Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Animal Products Processing
Secondary Number: 8109100
Postsecondary Number: A010402

01.0 SLAUGHTER BEEF AND SWINE ANIMALS--The student will be able to:

01.01 Humanely immobilize or stun beef and swine.
01.02 Stick or bleed animal.
01.03 Remove hide from beef cattle.
01.04 Trim carcass.
01.05 Remove paunch, intestines, liver, spleen and stomach.
01.06 Split carcass into halves.
01.07 Remove bone dust in sternum and vertebrae.
01.08 Weigh carcass.
01.09 Scald swine.
01.10 Dehair swine.
01.11 Singe hog.

02.0 OBSERVE SAFETY PRECAUTIONS--The student will be able to:

02.01 Apply first aid to minor cuts, bruises and burns.
02.02 Follow safe work habits.
02.03 Identify potential safety hazards.
02.04 Wear appropriate protective clothing.
02.05 Use proper lifting and carrying methods.
02.06 Adjust safety shields and devices.
02.07 Remove debris from work area.
02.08 Handle live cattle and swine in a safe manner.

03.0 USE AND MAINTAIN HAND AND POWER CUTTING TOOLS--The student will be able to:

03.01 Use power tools and equipment safely.
03.02 Use hand tools safely.
03.03 Use electric hand saws.
03.04 Identify tools and equipment.
03.05 Adjust tools and equipment.
03.06 Select and use appropriate tools and equipment.
03.07 Sharpen tools.
03.08 Clean tools.
03.09 Use scales.
03.10 Use knives and cleavers.
03.11 Repair tools and equipment.

04.0 SANITIZE FACILITIES AND EQUIPMENT--The student will be able to:

04.01 Identify personal sanitation practices.
04.02 Clean and sanitize hand and power meat cutting tools.
04.03 Describe the influence sanitary conditions may have on meat spoilage.

04.04 Clean and sanitize floors, ceilings and walls in cutting room and cooler.
04.05 Clean and sanitize racks and counters in cutting room and cooler.

05.0 FOLLOW LEGAL REGULATIONS--The student will be able to:

05.01 Identify sanitation requirements for licensing.
05.02 Display appropriate inspection certificates.
05.03 Interpret local, state and federal inspection requirements.
05.04 Interpret meat marketing regulations.
05.05 Identify agencies regulating the industry.

06.0 SELL AND DISPLAY MEATS--The student will be able to:

06.01 Identify various meat items to customers.
06.02 Label meat in display cases.
06.03 Price various cuts of meat for customers.
06.04 Take orders by telephone.
06.05 Stock meat displays.
06.06 Interpret customer's orders for various cuts.
06.07 Control temperature in storage areas.
06.08 Determine freezer storage life of various meats.

07.0 PACKAGE MEATS--The student will be able to:

07.01 Select appropriate wrapping materials.
07.02 Weigh meats for packaging.
07.03 Wrap meats for customers' home freezers.
07.04 Wrap and re-wrap packages for self-service.

08.0 CUT, TRIM AND SLICE, BEEF, PORK AND VEAL--The student will be able to:

08.01 Identify primal beef and pork cuts.
08.02 Bone beef and pork.
08.03 Break beef forequarter and hindquarter.
08.04 Identify retail and wholesale cuts of beef.
08.05 Cut wholesale and retail beef and pork cuts.
08.06 Trim cuts.
08.07 Identify retail and wholesale cuts pork and beef.
08.08 Slice ham.

09.0 PREPARE GROUND MEATS--The student will be able to:

09.01 Grind meats.
09.02 Identify pork meats to be used for ground ham loaf.
09.03 Select beef meats to be used for ground beef.
09.04 Select pork meats to be used for sausage.

10.0 INSPECT AND GRADE MEAT--The student will be able to:

10.01 Recognize signs of meat spoilage.
10.02 Grade meat carcasses.

10.03 Describe the influence grade has on preparation procedures and retail price.
10.04 Describe the various characteristics which determine grade.

11.0 KEEP RECORDS--The student will be able to:

11.01 Take inventory.
11.02 File information.
11.03 Keep sanitation and inspection records.
11.04 Order supplies.
11.05 Keep personnel records.
11.06 Maintain market information.

12.0 DEMONSTRATE PROFICIENCY IN APPLYING BASIC MATHEMATICS, SCIENCE AND COMMUNICATION SKILLS TO AGRICULTURE PROBLEM SOLVING--The student will be able to:

12.01 Solve time, distance, area, and volume problems.
12.02 Solve ratio, proportion, and percentage problems.
12.03 Identify and interpret basic quantitative information contained in agricultural charts, graphs, and tables.
12.04 Identify basic concepts of physics in agricultural applications.
12.05 Identify basic concepts of chemistry in agricultural applications.
12.06 Identify basic biological concepts in agricultural applications.
12.07 Prepare written documents using standard rules of English including punctuation, spelling, sentence structure and references.
12.08 Prepare and give oral presentations using standard rules of English including punctuation and sentence structure.
12.09 Demonstrate the scientific method in agricultural problem solving.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.03 Identify documents that may be required when applying for a job.
13.04 Complete a job application form correctly.
13.05 Demonstrate competence in job interview techniques.
13.06 Identify or demonstrate appropriate responses to criticism for employer, supervisor, or other persons.
13.07 Demonstrate knowledge of how to make job changes appropriately.
13.08 Demonstrate acceptable employee health habits.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8109110
Course Title: Animal Products Processing
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competency in the areas of safety, sanitation, sales, display, stocking and employability skills.

02.0 OBSERVE SAFETY PRECAUTIONS--The student will be able to:

02.01 Apply first aid to minor cuts, bruises and burns.
02.02 Follow safe work habits.
02.03 Identify potential safety hazards.
02.04 Wear appropriate protective clothing.
02.05 Use proper lifting and carrying methods.
02.06 Adjust safety shields and devices.
02.07 Remove debris from work area.
02.08 Handle live cattle and swine in a safe manner.

04.0 SANITIZE FACILITIES AND EQUIPMENT--The student will be able to:

04.01 Identify personal sanitation practices.
04.02 Clean and sanitize hand and power meat cutting tools.
04.03 Describe the influence sanitary conditions may have on meat spoilage.
04.04 Clean and sanitize floors, ceilings and walls in cutting room and cooler.
04.05 Clean and sanitize racks and counters in cutting room and cooler.

06.0 SELL AND DISPLAY MEATS--The student will be able to:

06.01 Identify various meat items to customers.
06.02 Label meat in display cases.
06.03 Price various cuts of meat for customers.
06.04 Take orders by telephone.
06.05 Stock meat displays.
06.06 Interpret customer's orders for various cuts.
06.07 Control temperature in storage areas.
06.08 Determine freezer storage life of various meats.

10.0 INSPECT AND GRADE MEAT--The student will be able to:

10.01 Recognize signs of meat spoilage.

12.0 DEMONSTRATE PROFICIENCY IN APPLYING BASIC MATHEMATICS, SCIENCE AND COMMUNICATION SKILLS TO AGRICULTURE PROBLEM SOLVING--The student will be able to:

12.01 Solve time, distance, area, and volume problems.
12.02 Solve ratio, proportion, and percentage probelems.
12.03 Identify and interpret basic quantitative information contained in agricultural charts, graphs, and tables.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

13.01 Conduct a job search.
13.02 Secure information about a job.
13.06 Identify or demonstrate appropriate responses to criticism for employer, supervisor, or other persons.
13.07 Demonstrate knowledge of how to make job changes appropriately.
13.08 Demonstrate acceptable employee health habits.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8109120
Course Credit: 1
Course Title: Animal Products Processing 2

COURSE DESCRIPTION:

This course is designed to develop competency in the areas of the use and maintenance of meat cutting equipment, packaging of meat and meat products, preparation of ground meats, record keeping and employability skills.

03.0 USE AND MAINTAIN HAND AND POWER CUTTING TOOLS--The student will be able to:

03.01 Use power tools and equipment safely.
03.02 Use hand tools safely.
03.03 Use electric hand saws.
03.04 Identify tools and equipment.
03.05 Adjust tools and equipment.
03.06 Select and use appropriate tools and equipment.
03.07 Sharpen tools.
03.08 Clean tools.
03.09 Use scales.
03.10 Use knives and cleavers.
03.11 Repair tools and equipment.

07.0 PACKAGE MEATS--The student will be able to:

07.01 Select appropriate wrapping materials.
07.02 Weigh meats for packaging.
07.03 Wrap meats for customers' home freezers.
07.04 Wrap and re-wrap packages for self-service.

09.0 PREPARE GROUND MEATS--The student will be able to:

09.01 Grind meats.
09.02 Identify pork meats to be used for ground ham loaf.
09.03 Select beef meats to be used for ground beef.
09.04 Select pork meats to be used for sausage.

11.0 KEEP RECORDS--The student will be able to:

11.01 Take inventory.
11.02 File information.
11.03 Keep sanitation and inspection records.
11.04 Order supplies.
11.05 Keep personnel records.
11.06 Maintain market information.

12.0 DEMONSTRATE PROFICIENCY IN APPLYING BASIC MATHEMATICS, SCIENCE AND COMMUNICATION SKILLS TO AGRICULTURE PROBLEM SOLVING--The student will be able to:

- 12.04 Identify basic concepts of physics in agricultural applications.
- 12.05 Identify basic concepts of chemistry in agricultural applications.
- 12.06 Identify basic biological concepts in agricultural applications.

13.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

- 13.03 Identify documents that may be required when applying for a job.
- 13.04 Complete a job application form correctly.
- 13.05 Demonstrate competence in job interview techniques.

Program: 8109100 Animal Products Processing

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Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8109130
Course Title: Animal Products Processing 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competency in the areas of slaughter, industry regulations, cutting and trimming beef and pork, grading of meats and carcasses and inspection procedures

01.0 SLAUGHTER BEEF AND SWINE ANIMALS--The student will be able to:

01.01 Humanely immobilize or stun beef and swine.
01.02 Stick or bleed animal.
01.03 Remove hide from beef cattle.
01.04 Trim carcass.
01.05 Remove paunch, intestines, liver, spleen and stomach.
01.06 Split carcass into halves.
01.07 Remove bone dust in sternum and vertebrae.
01.08 Weigh carcass.
01.09 Scald swine.
01.10 Dehair swine.
01.11 Singe hog.

05.0 FOLLOW LEGAL REGULATIONS--The student will be able to:

05.01 Identify sanitation requirements for licensing.
05.02 Display appropriate inspection certificates.
05.03 Interpret local, state and federal inspection requirements.
05.04 Interpret meat marketing regulations.
05.05 Identify agencies regulating the industry.

08.0 CUT, TRIM AND SLICE, BEEF, PORK AND VEAL--The student will be able to:

08.01 Identify primal beef and pork cuts.
08.02 Bone beef and pork.
08.03 Break beef forequarter and hindquarter.
08.04 Identify retail and wholesale cuts of beef.
08.05 Cut wholesale and retail beef and pork cuts.
08.06 Trim cuts.
08.07 Identify retail and wholesale cuts pork and beef.
08.08 Slice ham.

10.0 INSPECT AND GRADE MEAT--The student will be able to:

10.02 Grade meat carcasses.
10.03 Describe the influence grade has on preparation procedures and retail price.
10.04 Describe the various characteristics which determine grade.

12.0 DEMONSTRATE PROFICIENCY IN APPLYING BASIC MATHEMATICS, SCIENCE AND COMMUNICATION SKILLS TO AGRICULTURE PROBLEM SOLVING--The student will be able to:

12.07 Prepare written documents using standard rules of English including punctuation, spelling, sentence structure and references.

12.08 Prepare and give oral presentations using standard rules of English including punctuation and sentence structure.

12.09 Demonstrate the scientific method in agricultural problem solving.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Aquaculture
Occupational Area:	Agriculture
	Secondary
Program Numbers	8112000
CIP Number	0101.030300
Grade Level	9-12, 30, 31
Length	3 credits
Certification	VOC AGRI @4 AGRI @4 AGRICULTUR 1 @2

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment in positions in the aquaculture industry, including: 79999534, fish farmer, laborer, aquatic life (industry title); or to provide supplemental training for persons previously or currently employed in these occupations.

This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the agricultural industry; planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues and health, safety and environmental issues.

The content includes, but is not limited to, instruction that prepares individuals for activities including the production and harvesting of aquatic animals and plants. Instruction in feeding, culturing, protecting, prompting, harvesting and marketing aquatic species for food and other uses, maintenance and operation of related equipment, employability skills, mathematics, basic biological sciences, computer skills, communications, and human-relations skills are also included.

This program consists of the following courses when offered at the secondary level:

8106810 - Agriscience Foundations 1
8112010 - Aquaculture 2
8112020 - Aquaculture 3

II. **LABORATORY ACTIVITIES**: Agricultural laboratory activities are an integral part of this program, which includes the safe use of hand tools, portable power tools, soil and water sampling equipment, and specialized aquaculture/mariculture production and harvesting equipment.

III. **SPECIAL NOTE**: The FFA (secondary) is the appropriate vocational student organization for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Planned and supervised occupational activities must be provided through one or more or the following: (1) directed laboratory experience, (2) student project, (3) placement for experience, and (4) cooperative education.

Because of the production and marketing cycle of the aquaculture/mariculture industries, this program requires individual instruction and supervision of students for the entire period beyond the 180-day school year.

The cooperative method of instruction is appropriate for this program. Whenever the cooperative method is offered, the following are required for each student: a training plan that is signed by the student, teacher, and employer,including instructional objectives and a list of on-the-job and in-school learning experiences and a workstation that reflects the equipment, skills, and tasks that are relevant to the occupation that the student has chosen as a career goal. The student must be paid for work performed.

When a secondary student with a disability is enrolled in a vocational class with modifications to the curriculum framework, the particular outcomes and student performance standards which the student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEPs. The job title for which the student is being trained must be designated in the IEP.

IV. **INTENDED OUTCOMES**: After successfully completing this program, the student will be able to:

01.0 Describe the socioeconomic role of the agricultural industry.
02.0 Apply scientific and technological principles to the agricultural industry.
03.0 Practice agricultural safety.
04.0 Demonstrate the use of tools, equipment and instruments in the agricultural industry.
05.0 Describe the principles of integrated pest management (IPM).
06.0 Describe the principles of plant and/or animal growth and reproduction.
07.0 Apply business skills and economic principles to the agricultural industry.
08.0 Explain the basic marketing processes in the agricultural industry.
09.0 Demonstrate human-relations, communications, and leadership skills.
10.0 Describe the nature and origin of and career opportunities in aquaculture and mariculture.
11.0 Apply biological principles to the reproduction, identification and growth of aquaculture and mariculture species.

12.0 Safely operate, maintain and repair machinery, equipment and facilities used in aquaculture and/or mariculture

13.0 Demonstrate the management and environmentally sound use of water and land resources.

14.0 Assist in the propagation and rearing of seed.

15.0 Assist in producing aquaculture or mariculture species in one or more of the following: ponds, cages, tanks, raceways, saltwater containment facilities.

16.0 Control disease, pest and water quality problems.

17.0 Assist in harvesting and processing aquaculture or mariculture species.

18.0 Describe procedures used in locating markets and marketing aquaculture products and/or mariculture products.

19.0 Apply business management skills in managing an aquaculture and/or mariculture operation.

20.0 Identify applicable local, state, and federal rules and regulations and assistance programs.

21.0 Identify technological advances in the industry.

22.0 Demonstrate proficiency in applying basic mathematics, science and communication skills to aquaculture/mariculture problem solving.

23.0 Demonstrate leadership, employability, communications and human relations skills.

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Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Aquaculture
Secondary Number: 8112000
Postsecondary Number:

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.
02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.

03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label.(including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.
09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

10.0 DESCRIBE THE NATURE AND ORIGIN OF AND CAREER OPPORTUNITIES IN AQUACULTURE AND MARICULTURE--The students will be able to:

10.01 List two definitions of aquaculture and explain their differences.
10.02 Compare and contrast aquaculture with agriculture and aquaculture with fisheries.

10.03 List examples of aquatic crops and animals.
10.04 Trace the development of aquaculture.
10.05 List and describe the nature of five areas of aquaculture occupations.
10.06 Determine the educational and experience requirements needed to enter and advance in aquaculture/mariculture occupations.

11.0 APPLY BIOLOGICAL PRINCIPLES TO THE REPRODUCTION IDENTIFICATION AND GROWTH OF AQUACULTURE/MARICULTURE SPECIES--The students will be able to:

11.01 List and explain the meaning of morphology, anatomy and physiology.
11.02 List and describe the physiology of aquatic animals.
11.03 Identify and describe the basic structures and external anatomy of crustaceans.
11.04 Identify and describe the basic structure and internal anatomy of an oyster or a mussel.
11.05 Identify and describe the external and internal anatomy of fish.
11.06 Identify and describe the basic morphorology of aquatic macroalgae and mircoalgae.
11.07 Determine why aquatic crops may be more productive than terrestrial crops.
11.08 List and describe important characteristics in choosing a species.
11.09 Develop an information file in aquaculture species.
11.10 List and describe the major factors in the growth of aquatic fauna and flora.
11.11 Identify aquaculture/mariculture species of commercial importance in the surrounding area.

12.0 SAFELY OPERATE, MAINTAIN AND REPAIR MACHINERY, EQUIPMENT AND FACILITIES USED IN AQUACULTURE AND/OR MARICULTURE--The student will be able to:

12.01 Recognize and observe safety practices necessary in carrying out aquaculture activities.
12.02 Maintain and perform basic repairs on aquaculture machinery, equipment and facilities.
12.03 Safely operate aquaculture machinery and equipment.

13.0 DEMONSTRATE THE MANAGEMENT AND ENVIRONMENTALLY SOUND USE OF WATER AND LAND RESOURCES--The student will be able to:

13.01 Identify and describe the qualities water should posses for use in aquaculture.
13.02 Explain how changes in water affect aquatic life.
13.03 Explain, monitor and maintain freshwater/salt water quality standards for the production of desirable species.
13.04 Calculate volume in circular, rectangular and irregular shaped water structures.
13.05 List and explain sources of aquaculture pollution and methods of preventing and/or correcting these pollution problems.

13.06 Determine soil types, land slope and other factors to consider in choosing a location for a man made pond or other aquaculture operation.
13.07 Identify/explain environmentally safe methods of aquaculture wastewater disposal.
13.08 Identify and consult agencies regulating water quality pollution standards in order to prevent compliance problems.
13.09 Observe different stages of construction of ponds and/or other aquaculture production facilities.

14.0 ASSIST IN THE PROPAGATION AND REARING OF SEED--The student will be able to:

14.01 Identify factors to consider in determining whether to grow an aquaculture species.
14.02 Identify/describe facilities used in a grow out operation.
14.03 List sources of seed and how they are produced.
14.04 Determine the purpose and functions of a hatchery.
14.05 Identify and describe the sexual reproductive process and methods of reproducing aquaculture organisms.
14.06 Identify and describe the spawning facilities used in aquaculture.
14.07 Select a method of producing seed for an aqua farm.
14.08 List and explain the process for hatching seed in different incubators.
14.09 Determine kinds of feed to use in growing seed.
14.10 Feed, grade and transport seed.

15.0 ASSIST IN PRODUCING AQUACULTURE OR MARICULTURE SPECIES IN ONE OR MORE OF THE FOLLOWING: PONDS, CAGES, TANKS, RACEWAYS, SALTWATER CONTAINMENT FACILITIES--The student will be able to:

15.01 Identify the types of growing systems and important factors in their selection, design and use.
15.02 Determine economic factors to consider in choosing a system for commercial production.
15.03 Identify and describe important growing facility construction and site requirements.
15.04 Select species for specific growth facilities.
15.05 Determine feeding methods and feed aquaculture species.
15.06 Assist in managing water quality in different production systems.
15.07 Develop an aquaculture production problem that will show financial requirements for startup, production, harvesting, processing and marketing an aquaculture species and expected economic returns.

16.0 CONTROL DISEASE, PEST AND WATER QUALITY PROBLEMS--The student will be able to:

16.01 Identify major diseases of several locally important commercial species and list different methods of prevention and treatment.
16.02 Identify major pests of several locally important commercial species and list recommended control methods.

16.03 Perform methods of prevention, treatment, control listed in 16.01 and 16.02.

16.04 Identify water quality problems

16.05 Determine quality of water and practice recommended solutions where needed.

16.06 Apply the latest economically feasible technology in prevention, treatment and control of production problems.

17.0 ASSIST IN HARVESTING AND PROCESSING AQUACULTURE OR MARICULTURE SPECIES--The student will be able to:

17.01 Recognize and observe safety and sanitary practices in harvesting and processing aquaculture/mariculture species.

17.02 Determine harvesting practices recommended for commercially desirable aquaculture/mariculture species.

17.03 Determine equipment, labor, financial and legal requirements for harvesting.

17.04 Harvest commercially important aquaculture and/or mariculture species using recommended practices.

17.05 Determine processing practices recommended for commercially important species.

17.06 Determine equipment, labor, financial and legal requirements for processing.

17.07 Process commercially important species using recommended practices.

18.0 DESCRIBE PROCEDURES USED IN LOCATING MARKETS AND MARKETING AQUACULTURE AND/OR MARICULTURE PRODUCTS--The student will be able to:

18.01 Identify possible market outlets for aquaculture/mariculture products.

18.02 Develop a marketing plan for an aquaculture product commonly produced in the area.

18.03 Package and transport products as live, fresh, etc.

18.04 Determine legal and commercially important methods of transporting and marketing.

18.05 Market aquaculture and/or mariculture products.

19.0 APPLY BUSINESS MANAGEMENT SKILLS IN MANAGING AN AQUACULTURE AND/OR MARICULTURE OPERATION--The student will be able to:

19.01 Identify and list functions in the management process.

19.02 Demonstrate basic bookkeeping skills.

19.03 Determine cost of production/harvesting and profitability of different systems.

19.04 Determine procedures and costs for acquiring the land/water, machinery, equipment structures, etc., needed for an operation specified by the instructor.

19.05 Complete forms related to: (a) land purchase, (b) water leases, (c) permits, (d) licenses, (e) financial loans, (f) insurance, (g) others specified by the instructor.

19.06 Keep records related to (a) property ownership, (b) equipment acquired, (c) equipment repair and maintenance, (d) income and expense, (e) employee time and days, (f) income tax and social security, (g) insurance, (h) others specified by instructor.

19.07 Operate a production/harvesting system.

19.08 Complete supervised agricultural experience (SAE) records.

20.0 IDENTIFY APPLICABLE LOCAL, STATE AND FEDERAL RULES AND REGULATIONS AND ASSISTANCE PROGRAMS--The student will be able to:

20.01 Identify and observe laws and regulations affecting the industry in the local area.

20.02 Obtain required permits, licenses, leases, etc. for production and harvesting.

20.03 Identify and list agencies regulating the industry and their functions.

20.04 Identify and list government assistance programs available to the industry.

21.0 IDENTIFY TECHNOLOGICAL ADVANCES IN THE INDUSTRY--The student will be able to:

21.01 Identify and use basic computer programs.

21.02 Identify and analyze the economic feasibility of high technology machinery, equipment and systems available to the industry.

21.03 Visit, observe latest technology displays, field days, etc. available in the area.

21.04 Prepare a list of recent technological advances in the production/harvesting of aquaculture/mariculture products.

22.0 DEMONSTRATE PROFICIENCY IN APPLYING BASIC MATHEMATICS, SCIENCE AND COMMUNICATION SKILLS TO AQUACULTURE/MARICULTURE PROBELM SOLVING--The student will be able to:

22.01 Solve time, distance, area, and volume problems.

22.02 Solve ratio, proportion, and percentage problems.

22.03 Identify and interpret basic quantitative information contained in agricultural charts, graphs, and tables.

22.04 Identify basic concepts of physics in aquaculture/mariculture applications.

22.05 Identify basic concepts of chemistry in aquaculture/mariculture applications.

22.06 Identify basic biological concepts in aquaculture/mariculture.

22.07 Prepare written documents using standard rules of English including punctuation, spelling, sentence structure and references.

22.08 Prepare and give oral presentations using standard rules of English including punctuation and sentence structure.

22.09 Demonstrate the scientific method in aquaculture/mariculture problem solving.

23.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATION, AND HUMAN RELATIONS SKILLS--The student will be able to:

23.01 Conduct group meetings, using parliamentary procedure and public-speaking skills.

23.02 Identify acceptable work habits (ethics) and desired personal characteristics.

23.03 Demonstrate acceptable employee-hygiene habits.

23.04 Secure information about a job.

23.05 Complete a job application.

23.06 Demonstrate competence in job-interview techniques.

23.07 Demonstrate proper office procedures.

23.08 Demonstrate appropriate response to criticism from employer, supervisor, or other persons in the workplace.

23.09 Demonstrate knowledge of how to appropriately make a career change, including resigning from a job.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106810
Course Title: Agriscience Foundations I
Course Credit: 1

COURSE DESCRIPTION:

This course was developed as a core and is designed to develop competencies in the areas of agricultural history; global importance of agriculture; career opportunities; applied scientific and technological concepts; ecosystems; agricultural safety; principles of integrated pest management; principles of plant and animal growth; economic principles; agricultural marketing; and human-relations skills.

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.

02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.

09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8112010
Course Title: Aquaculture 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of nature and origin, career opportunities, biological principles, safety, water quality, seed production, market outlets, rules and regulations, technological advances, problem solving and leadership employability communication and human relations skills.

10.0 DESCRIBE THE NATURE AND ORIGIN OF AND CAREER OPPORTUNITIES IN AQUACULTURE AND MARICULTURE--The students will be able to:

10.01 List two definitions of aquaculture and explain their differences.
10.02 Compare and contrast aquaculture with agriculture and aquaculture with fisheries.
10.03 List examples of aquatic crops and animals.
10.04 Trace the development of aquaculture.
10.05 List and describe the nature of five areas of aquaculture occupations.
10.06 Determine the educational and experience requirements needed to enter and advance in aquaculture/mariculture occupations.

11.0 APPLY BIOLOGICAL PRINCIPLES TO THE REPRODUCTION IDENTIFICATION AND GROWTH OF AQUACULTURE AND MARICULTURE SPECIES--The students will be able to:

11.01 List and explain the meaning of morphology, anatomy and physiology.
11.02 List and describe the physiology of aquatic animals.
11.03 Identify and describe the basic structures and external anatomy of crustaceans.
11.04 Identify and describe the basic structure and internal anatomy of an oyster or a mussel.
11.05 Identify and describe the external and internal anatomy of fish.
11.06 Identify and describe the basic morphorology of aquatic macroalgae and mircoalgae.
11.07 Determine why aquatic crops may be more productive than terrestrial crops.
11.08 List and describe important characteristics in choosing a species.
11.09 Develop an information file in aquaculture species.
11.10 List and describe the major factors in the growth of aquatic fauna and flora.

11.11 Identify aquaculture/mariculture species of commercial importance in the surrounding area.

12.0 SAFELY OPERATE, MAINTAIN AND REPARI MACHINERY, EQUIPMENT AND FACILITIES USED IN AQUACULTURE AND/OR MARICULTURE--The student will be able to:

12.01 Recognize and observe safety practices necessary in carrying out aquaculture activities.
12.02 Maintain and perform basic repairs on aquaculture machinery, equipment and facilities.
12.03 Safely operate aquaculture machinery and equipment.

13.0 DEMONSTRATE THE MANAGEMENT AND ENVIRONMENTALLY SOUND USE OF WATER AND LAND RESOURCES--The student will be able to:

13.01 Identify and describe the qualities water should posses for use in aquaculture.
13.02 Explain how changes in water affect aquatic life.
13.03 Explain, monitor and maintain freshwater/salt water quality standards for the production of desirable species.

14.0 ASSIST IN THE PROPAGATION AND REARING OF SEED--The student will be able to:

14.01 Identify factors to consider in determining whether to grow an aquaculture species.
14.02 Identify/describe facilities used in a grow out operation.
14.03 List sources of seed and how they are produced.
14.04 Determine the purpose and functions of a hatchery.

18.0 DESCRIBE PROCEDURES USED IN LOCATING MARKETS AND MARKETING AQUACULTURE AND/OR MARICULTURE PRODUCTS--The student will be able to:

18.01 Identify possible market outlets for aquaculture/mariculture products.

19.0 APPLY BUSINESS MANAGEMENT SKILLS IN MANAGING AN AQUACULTURE AND/OR MARICULTURE OPERATION--The student will be able to:

19.01 Identify and list functions in the management process.
19.02 Demonstrate basic bookkeeping skills.
19.08 Complete supervised agricultural experience (SAE) records.

20.0 IDENTIFY APPLICABLE LOCAL, STATE AND FEDERAL RULES AND REGULATIONS AND ASSISTANCE PROGRAMS--The student will be able to:

20.01 Identify and observe laws and regulations affecting the industry in the local area.
20.02 Obtain required permits, licenses, leases etc. for production and harvesting.
20.03 Identify and list agencies regulating the industry and their functions.
20.04 Identify and list government assistance programs available to the industry.

21.0 IDENTIFY TECHNOLOGICAL ADVANCES IN THE INDUSTRY--The student will be able to:

21.01 Identify and use basic computer programs.
21.02 Identify and analyze the economic feasibility of high technology machinery, equipment and systems available to the industry.
21.03 Visit, observe latest technology displays, field days, etc. available in the area.
21.04 Prepare a list of recent technological advances in the production/harvesting of aquaculture/mariculture products.

22.0 DEMONSTRATE PROFICIENCY IN APPLYING BASIC MATHEMATICS, SCIENCE AND COMMUNICATION SKILLS TO AQUACULTURE/MARICULTURE PROBLEM SOLVING--The student will be able to:

22.01 Solve time, distance, area, and volume problems.
22.02 Solve ratio, proportion, and percentage problems.
22.03 Identify and interpret basic quantitative information contained in agricultural charts, graphs, and tables.
22.04 Identify basic concepts of physics in aquaculture/mariculture applications.
22.05 Identify basic concepts of chemistry in aquaculture/mariculture applications.
22.06 Identify basic biological concepts in aquaculture/mariculture.
22.07 Prepare written documents using standard rules of English including punctuation, spelling, sentence structure and references.
22.08 Prepare and give oral presentations using standard rules of English including punctuation and sentence structure.
22.09 Demonstrate the scientific method in aquaculture/mariculture problem solving.

23.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATION, AND HUMAN RELATIONS SKILLS--The student will be able to:

23.01 Conduct group meetings, using parliamentary procedure and public-speaking skills.
23.02 Identify acceptable work habits (ethics) and desired personal characteristics.
23.03 Demonstrate acceptable employee-hygiene habits.
23.04 Secure information about a job.
23.05 Complete a job application.

Program: 8112000 Aquaculture

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8112020
Course Title: Aquaculture 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the area of management and use of water, the propagation and rearing of seed, producing aquaculture or mariculture species, control of diseases, pests and water quality problems, harvesting and processing, marketing and transportation, management skills and leadership, employability, communication and human relation skills.

13.0 DEMONSTRATE THE MANAGEMENT AND ENVIRONMENTALLY SOUND USE OF WATER AND LAND RESOURCES--The student will be able to:

13.04 Calculate volume in circular, rectangular and irregular shaped water structures.
13.05 List and explain sources of aquaculture pollution and methods of preventing and/or correcting these pollution problems.
13.06 Determine soil types, land slope and other factors to consider in choosing a location for a man made pond or other aquaculture operation.
13.07 Identify/explain environmentally safe methods of aquaculture wastewater disposal.
13.08 Identify and consult agencies regulating water quality pollution standards in order to prevent compliance problems.
13.09 Observe different stages of construction of ponds and/or other aquaculture production facilities.

14.0 ASSIST IN THE PROGAGATION AND REARING OF SEED--The student will be able to:

14.05 Identify and describe the sexual reproductive process and methods of reproducing aquaculture organisms.
14.06 Identify and describe the spawning facilities used in aquaculture.
14.07 Select a method of producing seed for an aqua farm.
14.08 List and explain the process for hatching seed in different incubators.
14.09 Determine kinds of feed to use in growing seed.
14.10 Feed, grade and transport seed.

15.0 ASSIST IN PRODUCING AQUACULTURE OR MARICULTURE SPECIES IN ONE OR MORE OF THE FOLLOWING: PONDS, CAGES, TANKS, RACEWAYS, SALTWATER CONTAINMENT FACILITIES--The student will be able to:

15.01 Identify the types of growing systems and important factors in their selection, design and use.

15.02 Determine economic factors to consider in choosing a system for commercial production.
15.03 Identify and describe important growing facility construction and site requirements.
15.04 Select species for specific growth facilities.
15.05 Determine feeding methods and feed aquaculture species.
15.06 Assist in managing water quality in different production systems.
15.07 Develop an aquaculture production problem that will show financial requirements for startup, production, harvesting, processing and marketing an aquaculture species and expected economic returns.

16.0 CONTROL DISEASE, PEST AND WATER QUALITY PROBLEMS--The student will be able to:

16.01 Identify major diseases of several locally important commercial species and list different methods of prevention and treatment.
16.02 Identify major pests of several locally important commercial species and list recommended control methods.
16.03 Perform methods of prevention, treatment, control listed in 16.01 and 16.02.
16.04 Identify water quality problems
16.05 Determine quality of water and practice recommended solutions where needed.
16.06 Apply the latest economically feasible technology in prevention, treatment and control of production problems.

17.0 ASSIST IN HARVESTING AND PROCESSING AQUACULTURE OR MARICULTURE SPECIES--The student will be able to:

17.01 Recognize and observe safety and sanitary practices in harvesting and processing aquaculture/mariculture species.
17.02 Determine harvesting practices recommended for commercially desirable aquaculture/mariculture species.
17.03 Determine equipment, labor, financial and legal requirements for harvesting.
17.04 Harvest commercially important aquaculture and/or mariculture species using recommended practices.
17.05 Determine processing practices recommended for commercially important species.
17.06 Determine equipment, labor, financial and legal requirements for processing.
17.07 Process commercially important species using recommended practices.

18.0 DESCRIBE PROCEDURES USED IN LOCATING MARKETS AND MARKETING AQUACULTURE AND/OR MARICULTURE PRODUCTS--The student will be able to:

18.02 Develop a marketing plan for an aquaculture product commonly produced in the area.
18.03 Package and transport products as live, fresh,etc.
18.04 Determine legal and commercially important methods of transporting and marketing.

18.05 Market aquaculture and/or mariculture products.

19.0 APPLY BUSINESS MANAGEMENT SKILLS IN MANAGING AN AQUACULTURE AND/OR MARICULTURE OPERATION--The student will be able to:

19.03 Determine cost of production/harvesting and profitability of different systems.
19.04 Determine procedures and costs for acquiring the land/water, machinery, equipment structures, etc., needed for an operation specified by the instructor.
19.05 Complete forms related to: (a) land purchase, (b) water leases, (c) permits, (d) licenses, (e) financial loans, (f) insurance, (g) others specified by the instructor.
19.06 Keep records related to: (a) property ownership, (b) equipment acquired, (c) equipment repair and maintenance, (d) income and expense, (e) employee time and days, (f) income tax and social security, (g) insurance, (h) others specified by instructor.
19.07 Operate a production/harvesting system.
19.08 Complete supervised occupational experienced (SAE) records.

23.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATION, AND HUMAN RELATIONS SKILLS--The student will be able to:

23.06 Demonstrate competence in job-interview techniques.
23.07 Demonstrate proper office procedures.
23.08 Demonstrate appropriate response to criticism from employer, supervisor, or other persons in the workplace.
23.09 Demonstrate knowledge of how to appropriately make a career change, including resigning from a job.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Citrus Production Technology
Occupational Area:	Agriculture
	PSV
CIP Number	0102.040300
Grade Level	College Credits
Length	AS Degree
Certification	

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment as farmers, tree fruit (403.161-010), managers, production (180.161-010), buyers (162.157-018), inspectors, agricultural commodities (168.287-010), biological aides (049.384-010), superintendents, production (180.167-958), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, instruction that prepares individuals to produce citrus trees and fruit and manage services associated with citrus production. Subject matter includes pest control, propagation, nutrition, irrigation, equipment management and marketing, as well as leadership, communication, employability and human relations skills.

II. **LABORATORY ACTIVITIES**: Citrus laboratory and field activities are an integral part of this program including the safe use of mechanics' hand tools, tractors and field equipment, quality control test instruments, chemical applicators, irrigation equipment and power sprayers.

III. **SPECIAL NOTE**: National Postsecondary Agricultural Student Organization is the appropriate vocational student organization for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Planned and supervised occupational activities may be provided through directed laboratory experience, practicum or cooperative experience. Whenever the cooperative method of instruction is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks which are relevant to the occupation which the student has chosen as a career goal. The student must receive compensation for work performed.

The typical length of this program for the average achieving student is an associate degree. The standard credit hour length for this program is 62 hours.

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01.0 Classify and select citrus rootstocks and scions.
02.0 Identify varieties of citrus.
03.0 Manage the propagation of citrus.
04.0 Analyze nutritional disorders and develop a fertilization program.
05.0 Identify insects, diseases and other pathogens of citrus and develop a pest control management program.
06.0 Identify and control citrus weed problems.
07.0 Protect citrus from frost and freeze damage.
08.0 Calculate the irrigation requirements of citrus and manage an irrigation program.
09.0 Select, manage and maintain citrus production equipment.
10.0 Determine maturity and quality of citrus fruits.
11.0 Keep production, financial, personnel and maintenance records.
12.0 Market citrus nursery and grove products.
13.0 Manage the growth and culture of citrus.
14.0 Harvest citrus.
15.0 Interpret and incorporate technical information into management practices.
16.0 Demonstrate leadership, employability, communications and human relations skills.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Citrus Production Technology
Secondary Number:
Postsecondary Number: 0102.040300

01.0 CLASSIFY AND SELECT CITRUS ROOTSTOCKS AND SCIONS--The student will be able to:

01.01 Classify citrus rootstocks and scions according to taxonomy.
01.02 Select scion varieties best suited for specific soil types, rootstock compatibility, disease resistance, insect resistance, cold resistance and specific marketing purposes.
01.03 Select rootstocks best suited for specific soil types, scion compatibility, nematode resistance, insect resistance, cold resistance, disease and virus resistance and specific marketing purposes.

02.0 IDENTIFY VARIETIES OF CITRUS--The student will be able to:

02.01 Identify citrus fruit varieties by color, shape, texture, maturity, seeds and leaves.
02.02 Identify rootstock varieties by characteristic of fruit, leaves and stems.

03.0 MANAGE THE PROPAGATION OF CITRUS--The student will be able to:

03.01 Select a site for seedbeds and apply for site approval.
03.02 Supervise the preparation of site and plant certified seed.
03.03 Manage the culture and care of seedlings.
03.04 Select and cut certified budwood.
03.05 Manage the budding and wrapping of seedlings.
03.06 Train and supervise workers to maintain accurate records and counts in tagging and labeling rootstocks and scion varieties.
03.07 Supervise the culture and care of young budded nursery stock.
03.08 Supervise the digging and handling of nursery stock for potting or bareroot shipment.
03.09 Maintain strict nursery sanitation practices.

04.0 ANALYZE NUTRITIONAL DISORDERS AND DEVELOP A FERTILIZATION PROGRAM--The student will be able to:

04.01 Collect soil and plant tissue samples for analysis.
04.02 Interpret results of soil and tissue analysis.
04.03 Develop a fertilization program or schedule for grove and nursery.
04.04 Identify nutritional disorders and deficiencies in grove and nursery.
04.05 Calculate fertilization rates for citrus.
04.06 Compare advantages and disadvantages of different sources and forms of plant nutrients.
04.07 Calibrate fertilization equipment.

04.08 Supervise application of fertilizer.
04.09 Supervise cleaning and storage of fertilizer application equipment.

05.0 IDENTIFY INSECTS, DISEASES AND OTHER PATHOGENS OF CITRUS AND DEVELOP A PEST CONTROL MANAGEMENT PROGRAM--The student will be able to:

05.01 Identify insects, diseases and other pathogens of citrus.
05.02 Determine extent and severity of pest infestation.
05.03 Select and supervise the application of pesticides.
05.04 Calibrate and adjust pesticide applications.
05.05 Determine effectiveness of application or spray program.
05.06 Develop a pest management program or schedule.
05.07 Train workers in the safe use of pesticides.
05.08 Recognize symptoms of pesticide poisoning and provide first aid.
05.09 Safely dispose of pesticide containers.
05.10 Observe and maintain grove and nursery sanitation practices.
05.11 Supervise the cleaning and maintenance of pesticide application equipment.

06.0 IDENTIFY AND CONTROL CITRUS WEED PROBLEMS--The student will be able to:

06.01 Identify noxious weeds and vines of citrus.
06.02 Select appropriate herbicide and supervise the application.
06.03 Calibrate and adjust herbicide applicators.
06.04 Develop a weed/vine control program or schedule.
06.05 Determine appropriate conditions for effective and safe application of herbicides.
06.06 Supervise mechanical weed and vine control.

07.0 PROTECT CITRUS FROM FROST AND FREEZE DAMAGE--The student will be able to:

07.01 Monitor and interpret weather forecasts.
07.02 Supervise the preparation and maintenance of grove, nursery and equipment for frost and freeze.
07.03 Supervise procedures for protecting citrus from cold damage.
07.04 Protect young trees from cold damage.
07.05 Compare cost and efficiency of various methods of cold protection.

08.0 CALCULATE THE IRRIGATION REQUIREMENTS OF CITRUS AND MANAGE AN IRRIGATION PROGRAM--The student will be able to:

08.01 Determine irrigation requirements.
08.02 Plan an irrigation system.
08.03 Supervise the installation of irrigation equipment.
08.04 Service and maintain electric and engine driven pumps.
08.05 Operate and service low volume irrigation system.
08.06 Operate and service overhead irrigation system.
08.07 Calculate cost efficiency of irrigation system.

09.0 SELECT, MANAGE AND MAINTAIN CITRUS PRODUCTION EQUIPMENT--The studentwill be able to:

09.01 Determine the equipment requirements for the citrus operation.
09.02 Compare cost, efficiency and maintenance requirements of various models and makes of equipment.
09.03 Determine equipment replacement schedule.
09.04 Develop a schedule for servicing of equipment.
09.05 Instruct workers in the safe and efficient use of equipment.
09.06 Supervise the maintenance and repair of citrus equipment.
09.07 Keep maintenance records.

10.0 DETERMINE MATURITY AND QUALITY OF CITRUS FRUIT--The student will be able to:

10.01 Determine solids using refractometer.
10.02 Interpret results of citrus juice analysis.
10.03 Estimate quality grade of product.
10.04 Estimate date of maturity of fruit.

11.0 KEEP PRODUCTION, FINANCIAL, PERSONNEL AND MAINTENANCE RECORDS--The student will be able to:

11.01 Maintain fertilizer and pesticide application records.
11.02 Make grove plats.
11.03 Keep equipment maintenance and service records.
11.04 Keep inventory records.
11.05 Record production information.
11.06 Record labor and personnel information.
11.07 Analyze cost and effectiveness of management practices.
11.08 Prepare written reports.
11.09 Determine insurance needs.

12.0 MARKET CITRUS NURSERY AND GROVE PRODUCTS--The student will be able to:

12.01 Determine market for product.
12.02 Maintain customer service relations.
12.03 Arrange for transportation of product.
12.04 Evaluate market.
12.05 Interpret and analyze marketing contracts.
12.06 Locate sources of marketing information services.

13.0 MANAGE THE GROWTH AND CULTURE OF CITRUS--The student will be able to:

13.01 Supervise daily operations.
13.02 Determine work schedules.
13.03 Inspect grove/nursery properties.
13.04 Hire, train and dismiss employees.
13.05 Determine cultural practices.
13.06 Implement instructions and requests.

14.0 HARVEST CITRUS--The student will be able to:

14.01 Make arrangements for harvesting crop.

14.02 Interpret and analyze harvesting contract.
14.03 Monitor harvesting operation.
14.04 Prepare contingency plans for harvesting citrus.

15.0 INTERPRET AND INCORPORATE TECHNICAL INFORMATION INTO MANAGEMENT PRACTICES--The student will be able to:

15.01 Observe local, state and federal pesticide regulations.
15.02 Observe grove and nursery site regulations.
15.03 Observe and interpret marketing restrictions and agreements.
15.04 Interpret and observe certification, licensing and inspection requirements.
15.05 List agencies responsible for the regulation of the citrus industry.
15.06 Attend workshops and seminars to upgrade skills and knowledge.
15.07 Maintain a file for technical information, periodicals and other publications.
15.08 Determine sources of up-to-date information and services.
15.09 List societies, organizations and associations related to occupation or profession.

16.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:

16.01 Conduct a job search.
16.02 Secure information about a job.
16.03 Identify documents that may be required when applying for a job.
16.04 Complete a job application form correctly.
16.05 Demonstrate competence in job interview techniques.
16.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
16.07 Identify acceptable work habits.
16.08 Demonstrate knowledge of how to make job changes appropriately.
16.09 Demonstrate acceptable employee health habits.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title: Crop and Specialty Plant Production
Occupational Area: Agriculture

	Secondary	PSAV
Program Numbers	**8106400**	**A010304**
CIP Number	0101.030401	0101.030401
Grade Level	9-12, 30, 31	30, 31
Length	6 credits	900 hours
Certification	VOC AGRI @4 AGRI @4 AGRI PROD #7 AGRICULTUR 1 @2	VOC AGRI @4 AGRI @2 @4 AGRI PROD @7 G AGRICULTUR 1 @2

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment as farmers, vegetable (402.161-010), farmers, field crop (404.161-010), farmers, tree-fruit-nut crops (403.161-010), farmers, general (421.161-010), supervisors, vegetable farming (402.131-010), supervisors, field crop farming (404.131-010), supervisors, diversified crops (407.131-010), farm workers, fruit I (403.683-010), farm workers, fruit II (403.687.010) or to provide supplemental training for person previously or currently employed in these occupations.

This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the agricultural industry; planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues and health, safety and environmental issues.

The content includes, but is not limited to, instruction that prepares individuals to work in enterprises concerned with the production of grain, fiber, forage, citrus, vegetables and other specialty crops. Subject matter also includes planting, fertilization, irrigation, weed control, pest control, harvesting and marketing, facility maintenance, farm equipment, record keeping, farm credit, supervisory skills, safety, and leadership and employability skills.

Listed below are the courses that comprise this program when offered at the secondary level:

8106810 - Agriscience Foundations
8106820 - Agritechnology 1
8106830 - Agritechnology 2
8106440 - Crop and Specialty Plant Production 4
8106450 - Crop and Specialty Plant Production 5
8106460 - Crop and Specialty Plant Production 6

II. **LABORATORY ACTIVITIES**: Agricultural shop and land laboratory activities are an integral part of this program including the safe use of mechanics' hand tools, field hand tools, hand and portable power carpentry tools, arc welders, oxy-acetylene torches, tractors and field cultivation equipment, power sprayers, chemical applicators, harvest equipment and planting equipment.

III. **SPECIAL NOTE:** FFA (secondary) and the National Postsecondary Agricultural Student Organization (postsecondary) are the appropriate vocational student organizations for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Planned and supervised occupational activities must be provided through one or more of the following: (1) directed laboratory experience, (2) student projects, (3) placement for experience, (4) cooperative experience.

Because of the production and marketing cycle of the crop production industry, this program requires individual instruction and supervision of students for the entire period beyond the 180-day school year.

The cooperative method of instruction is appropriate for this program. Whenever the cooperative method is offered, the following are required for each student: a training plan that is signed by the student, teacher, and employer,including instructional objectives and a list of on-the-job and in-school learning experiences and a workstation that reflects the equipment, skills, and tasks that are relevant to the occupation that the student has chosen as a career goal. The student must be paid for work performed.

Intended outcomes 11, 12, and 13 in the Agritechnology core (8106800) are optional for this program.

In accordance with Rule 6A-10.040, FAC., the minimum basic skills grade level required for this postsecondary adult vocational program is: Mathematics 8.0, Language 8.0, Reading 8.0. This grade level number corresponds to a grade equivalent score obtained on a state designated basic skills examination.

The typical length of this program for the average achieving student is 900 hours.

When a secondary student with a disability is enrolled in a vocational class with modifications to the curriculum framework, the particular outcomes and student performance standards which the student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEPs. The job title for which the student is being trained must be designated in the IEP.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

Note--Daggers (♦) indicate core outcomes that are optional for Crop and Specialty Plant Production however they are listed in this document.

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01.0 Describe the socioeconomic role of the agricultural industry.
02.0 Apply scientific and technological principles to the agricultural industry.
03.0 Practice agricultural safety.
04.0 Demonstrate the use of tools, equipment and instruments in the agricultural industry.
05.0 Describe the principles of integrated pest management (IPM).
06.0 Describe the principles of plant and/or animal growth and reproduction.
07.0 Apply business skills and economic principles to the agricultural industry.
08.0 Explain the basic marketing processes in the agricultural industry.
09.0 Demonstrate human relations, communications, and leadership skills.
10.0 Explore the scope of the agriscience industry.
♦ 11.0 Provide for proper animal health and nutrition.
♦ 12.0 Identify procedures in animal production and reproduction.
♦ 13.0 Use procedures for exhibiting and marketing animals.
14.0 Compare, select, and use plant production systems.
15.0 Fertilize plants and crops.
16.0 Irrigate plants and crops.
17.0 Control plant pests.
18.0 Operate, maintain, and service facilities, tools, and equipment.
19.0 Describe procedures for harvesting and marketing plant materials.
20.0 Apply principles of agribusiness finance.
21.0 Demonstrate leadership, employability, communication, and human-relations skills.
22.0 Prepare soil for planting crops
23.0 Select seed.
24.0 Plant crops.
25.0 Identify and select varieties of rootstocks and scions for selected specialty plants.
26.0 Propagate specialty plants.
27.0 Control weeds, insects, diseases and other pathogens of crops and specialty plants.
28.0 Prune and hedge specialty plants.
29.0 Manage farm records.
30.0 Observe laws and regulations regarding the plant industry.
31.0 Organize jobs and supervise workers.

32.0 Construct and repair farm facilities.

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Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Crop And Specialty Plant Production
Secondary Number: 8106400
Postsecondary Number: A010304

NOTE: Where appropriate for this program, student performance standards have been added and are identified with and asterick (*). These standards are included in the courses above the core.

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.
02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).
* 03.05 Identify possible consequences of not following safety precaustions.
* 03.06 Follow all safety precautions when using pesticides and farming and welding equipment.

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label.(including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume ratio, proportion, and percentage problems in agriscience.
* 05.09 Control weeds with cultivation equipment.
* 05.10 Evaluate weed control practives for effectiveness.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietership, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC THE MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.
* 08.03 Determine market grade requirements for various crops.
* 08.04 Determine how local market prices are set.
* 08.05 Develop a marketing program for harvested crop.

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.

09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.
09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

10.0 EXPLORE THE SCOPE OF THE AGRISCIENCE INDUSTRY--The student will be able to:

10.01 Investigate career opportunities in agriscience industries. Levels I & II.
10.02 Describe training requirements for entry and advancement in agriscience careers. Levels I & II.
10.03 Identify professional organizations and trade journals in the agriscience industry.

11.0 PROVIDE FOR PROPER ANIMAL HEALTH AND NUTRITION--The student will be able to:

11.01 Recognize and describe prevention and treatment of common animal diseases, disorders, and pests. Level II.
11.02 Read, interpret, and follow directions on pesticide, medication, and other additive labels.
11.03 Clean and disinfect animal equipment and facilities.
11.04 Explain proper disposal of animal waste with regard to sanitation, economics, and environmental implications.
11.05 Describe nutritional requirements of animals.
11.06 Formulate and compute least-cost feed rations.
11.07 Select growth stimulators and implants.
11.08 Determine feeding rates and methods of feeding animals.

12.0 IDENTIFY PROCEDURES IN ANIMAL PRODUCTION AND REPRODUCTION--The student will be able to:

12.01 Identify major parts of livestock and poultry anatomy.
12.02 Identify commercially important breeds of animals.
12.03 Describe desirable characteristics of breeding and market animals.
12.04 Identify wholesale cuts of beef, pork, lamb, and poultry.
12.05 Compare and select appropriate breeding methods for different agricultural enterprises.
12.06 Explain the reproductive cycles of commercially important animals.
12.07 Identify signs of animal pregnancy, parturition, and infertility.
12.08 Describe approved care for newborn animals.
12.09 Describe methods of permanent animal identification.
12.10 Describe methods of restraining, loading, handling, and transporting animals safely.

13.0 USE PROCEDURES FOR EXHIBITING AND MARKETING ANIMALS--The student will be able to:

13.01 Demonstrate the procedures for preparing, maintaining, and exhibiting commercially important animals.
13.02 Collect and interpret market reports and identify market outlets for livestock.
13.03 Compare and select appropriate marketing systems.
13.04 Determine appropriate evaluation criteria for animals.
13.05 Prepare appropriate shipping and health certificates required for exhibiting or marketing animals.

14.0 COMPARE, SELECT, AND USE PLANT PRODUCTION SYSTEMS--The student will be able to:

14.01 Compare different plant production systems.
14.02 Propagate, grow, and transplant plants.
14.03 Identify varieties of local commercial plants and field crops.
14.04 Select and prepare site and seed bed for planting.
14.05 Identify methods of pruning plants to achieve desired growth and to maintain health.
14.06 Calculate planting rate and spacing.
14.07 Operate and adjust planting equipment.

15.0 FERTILIZE PLANTS AND CROPS--The student will be able to:

15.01 Develop fertilization schedules and calculate fertilizer rates for plants; solve time, distance, area, and volume problems in agriscience.
15.02 Identify common nutrient-deficiency symptoms in plants.
15.03 Calibrate fertilization equipment and fertilize plants.
15.04 Interpret information on a fertilizer label.
15.05 Compare sources and forms of nutrients.
15.06 Determine methods of applying fertilizer materials.
* 15.07 Determine nutrient requirements for individual crops.
* 15.08 Collect soil and/or plant tissue samples for analysis and interpret results.

16.0 IRRIGATE PLANTS AND CROPS--The student will be able to:

16.01 Recognize soil and plant conditions indicating irrigation needs and develop an irrigation schedule.
16.02 Compare and select irrigation equipment and methods.
16.03 Install, operate, maintain, and repair irrigation equipment.
* 16.04 Determine irrigation requirements for a variety of crops.
* 16.05 Interpret water quality analysis reports.
* 16.06 List agencies responsible for local stream laws and ground water policies.
* 16.07 Operate and maintain low volume irrigation systems.
* 16.08 Operate, adjust and maintain volume gun and other portable irrigation equipment.
* 16.09 Maintain and repair permanent overhead irrigation systems.
* 16.10 Operate and service electric and engine driven pumps.
* 16.11 Keep irrigation records.

17.0 CONTROL PLANT PESTS--The student will be able to:

17.01 Identify common plant pests and their damages.
17.02 Describe life cycles of insects, pests, and diseases.
17.03 Identify the procedures and requirements for obtaining a restricted-use-pesticide operator's license.
17.04 Select, mix, and apply a nonrestricted chemical according to the label and local, state, federal and EPA regulations.

18.0 OPERATE, MAINTAIN, AND SERVICE FACILITIES, TOOLS, AND EQUIPMENT--The student will be able to:

18.01 Demonstrate basic facility maintenance, installation, or repair.
18.02 Safely operate, maintain, service, and repair equipment.
18.03 Use and maintain hand tools and power equipment (e.g., power saws, welders).
18.04 Maintain and service small gasoline engines.
* 18.05 Maintain equipment maintenance and service records.
* 18.06 Cut and weld with oxyacetylene and arc welding equipment.

19.0 DESCRIBE PROCEDURES FOR HARVESTING AND MARKETING PLANT MATERIALS--The student will be able to:

19.01 Determine maturity, condition, quality, and volume of crops to be harvested.
19.02 Describe procedures for harvesting crops.
19.03 Determine kinds and types of storage facilities for crops.
19.04 Grade, treat, pack, and/or store harvested crop.
19.05 Interpret and analyze market information.
19.06 Compare, select, and locate marketing channels and develop a marketing program.
* 19.07 Measure moisture content of harvested crops.
* 19.08 Plan harvest according to conditions and labor requirements.
* 19.09 Adjust harvesting equipment for specific crops.
* 19.10 Harvest a crop using harvesting equipment.
* 19.11 Monitor harvesting operations.
* 19.12 Protect stored crops from pests.
* 19.13 Keep harvest records.

20.0 APPLY PRINCIPLES OF AGRIBUSINESS FINANCE--The student will be able to:

20.01 Identify major sources of credit for agribusiness.
20.02 Complete a business loan application.
20.03 Explain the purposes and structures of contracts, leases, deeds, and insurance policies.
20.04 Maintain and interpret supervised agricultural experience (SAE) records (e.g., depreciation, inventory, budgets).
* 20.05 Develop equitable rental and leasing agreements for land and equipment.
* 20.06 Prepare a case using accepted forms for obtaining credit at a lending institution.

21.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATION, AND HUMAN-RELATIONS SKILLS--The student will be able to:

21.01 Conduct group meetings using parliamentary procedure and public-speaking skills.
21.02 Identify appropriate work and personal habits. Level I.
21.03 Identify appropriate work and personal habits. Level II.
21.04 Complete a job application.
* 21.05 Conduct a job search
* 21.06 Secure information about a job.
* 21.07 Identify documents that may be required when applying for a job.
* 21.08 Demonstrate competence in job interview techniques.
* 21.09 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
* 21.10 Demonstrate knowledge of how to make job changes appropriately.

22.0 PREPARE SOIL FOR PLANTING CROPS--The student will be able to:

22.01 Identify soil texture.
22.02 Describe types of soil erosion.
22.03 Adjust tillage equipment to field conditions.
22.04 Till soil.
22.05 Evaluate and perform vegetatative and mechanical conservation practices.

23.0 SELECT SEED--The student will be able to:

23.01 Classify plants as annuals, biennials or perennials.
23.02 Interpret and evaluate a seed tag.
23.03 Evaluate and select seed and transplants.
23.04 Identify the requirements for seed certification.
23.05 Test seed for germination.

24.0 PLANT CROPS--The student will be able to:

24.01 Plant and grow a seedbed in a climate-controlled structure.
24.02 Prepare seed pieces for planting (asexual propagation).
24.03 Determine method for planting and select appropriate equipment.
24.04 Prepare seed and plant crops.
24.05 Grow and maintain seedlings.

25.0 IDENTIFY AND SELECT VARIETIES OF ROOTSTOCKS AND SCIONS FOR SELECTED SPECIALTY PLANTS--The student will be able to:

25.01 Identify specialty plant varieties by color, shape, texture and seeds.
25.02 Identify rootstock varieties for selected specialty plants.
25.03 Select rootstock varieties for selected specialty plants best suited for specific soil types, disease resistance and scion compatibility.
25.04 Select scion varieties for selected specialty plants best suited for specific soil types, rootstock compatibility, disease resistance, insect resistance, cold resistance and for specific marketing purposes.

26.0 PROPAGATE SPECIALTY PLANTS--The student will be able to:

26.01 Select and cut certified budwood.
26.02 Bud and wrap seedlings.
26.03 Grow and maintain young budded nursery stock.
26.04 Dig nursery stock for potting or prepare for bareroot shipment.
26.05 Maintain nursery sanitation.

27.0 CONTROL WEEDS, INSECTS, DISEASES AND OTHER PATHOGENS OF CROPS AND SPECIALTY PLANTS--The student will be able to:

27.01 Identify noxious weeds and vines of crops and specialty plants.
27.02 Identify insects, diseases and other pathogens of crops and specialty plants.
27.03 Demonstrate the safe use of pesticides, protective clothing and respiration equipment.
27.04 Safely dispose of pesticide containers.
27.05 Clean and maintain pesticide applicators.
27.06 Observe and maintain grove and nursery sanitation practices.

28.0 PRUNE AND HEDGE SPECIALTY PLANTS--The student will be able to:

28.01 Hand prune selected specialty plants.
28.02 Prune nursery trees.
28.03 Prune freeze damaged plants.
28.04 Determine appropriate time and method for hedging and topping mature citrus trees or other selected specialty plants.

29.0 MANAGE FARM RECORDS--The student will be able to:

29.01 Maintain farm financial records (expense, receipts, inventories, depreciation).
29.02 Summarize farm financial records (determine gross income, net income, enterprise income).
29.03 Distinguish between assets and liabilities.
29.04 Maintain fertilization and pesticide application use records.
29.05 Record cultural and production information.
29.06 Determine cost and efeectiveness of cultural and management practices.
29.07 Make grove plats.
29.08 Maintain labor and personnel records.
29.09 Prepare an annual budget.
29.10 Identify sources and kinds of farm insurance.
29.11 Maintain equipment, machinery, and facilities inventory records.
29.12 Determine credit needs, cash flow needs, and returns on investments.
29.13 Secure professional services and information.

30.0 OBSERVE LAWS AND REGULATIONS REGARDING THE PLANT INDUSTRY--The student will be able to:

30.01 Observe nursery site regulations.
30.02 Know and observe quality control regulations.

30.03 Be familiar with state and federal agencies regulating the plant industry (including citrus).
30.04 Be familiar with laws regulating the movement of citrus trees, fruit, and other plant commodities.

31.0 ORGANIZE JOBS AND SUPERVISE WORKERS--The student will be able to:

31.01 Demonstrate and instruct employees in their tasks.
31.02 Enforce safety regulations.
31.03 Prepare daily work plans.
31.04 Evaluate performance of workers.
31.05 Acquire equipment and materials.

32.0 CONSTRUCT AND REPAIR FARM FACILITIES--The student will be able to:

32.01 Build and repair fences.
32.02 Form and pour concrete.
32.03 Square and build a simple farm building.
32.04 Develop a bill of materials for a construction project.

Program: 8106400 Crop and Speciality Plant Production

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106810
Course Title: Agriscience Foundations I
Course Credit: 1

COURSE DESCRIPTION:

This course was developed as a core and is designed to develop competencies in the areas of agricultural history; global importance of agriculture; career opportunities; applied scientific and technological concepts; ecosystems; agricultural safety; principles of integrated pest management; principles of plant and animal growth; economic principles; agricultural marketing; and human relations skills.

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.

02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.

09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106820
Course Title: Agritechnology 1
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of agriscience industry careers; prevention and treatment of livestock diseases; livestock anatomy; wholesale cuts of meat; animal reproduction and identification; animal safety; animal-health certification; plant growth; plant fertilization; safe use of pesticides; maintenance of tools and equipment; record keeping; and employability skills.

10.0 EXPLORE THE SCOPE OF THE AGRISCIENCE INDUSTRY--The student will be able to:

10.01 Investigate career opportunities in agriscience industries. Level I.
10.02 Describe training requirements for entry and advancement in agriscience careers. Level I.

11.0 PROVIDE FOR PROPER ANIMAL HEALTH AND NUTRITION--The student will be able to:

11.01 Recognize and describe prevention and treatment of common animal diseases, disorders, and pests. Level I.
11.03 Clean and disinfect animal equipment and facilities.
11.04 Explain proper disposal of animal waste with regard to sanitation, economics, and environmental implications.

12.0 IDENTIFY PROCEDURES IN ANIMAL PRODUCTION AND REPRODUCTION--The student will be able to:

12.01 Identify major parts of livestock and poultry anatomy.
12.02 Identify commercially important breeds of animals.
12.03 Describe desirable characteristics of breeding and market animals.
12.04 Identify wholesale cuts of beef, pork, lamb, and poultry.
12.05 Compare and select appropriate breeding methods for different agricultural enterprises.
12.06 Explain the reproductive cycles of commercially important animals.
12.07 Identify signs of animal pregnancy, parturition, and infertility.
12.08 Describe approved care for newborn animals.
12.09 Describe methods of permanent animal identification.
12.10 Describe methods of restraining, loading, handling, and transporting animals safely.

13.0 USE PROCEDURES FOR EXHIBITING AND MARKETING ANIMALS--The student will be able to:

13.01 Demonstrate the procedures for preparing, maintaining, and exhibiting commercially important animals.
13.04 Determine appropriate evaluation criteria for animals.
13.05 Prepare appropriate shipping and health certificates required for exhibiting or marketing animals.

14.0 COMPARE, SELECT, AND USE PLANT PRODUCTION SYSTEMS--The student will be able to:

14.01 Compare different plant production systems.
14.02 Propagate, grow, and transplant plants.
14.04 Select and prepare site and seed bed for planting.
14.05 Identify methods of pruning plants to achieve desired growth and to maintain health.

15.0 FERTILIZE PLANTS AND CROPS--The student will be able to:

15.04 Interpret information on a fertilizer label.
15.05 Compare sources and forms of nutrients.
15.06 Determine methods of applying fertilizer materials.

18.0 OPERATE, MAINTAIN, AND SERVICE FACILITIES, TOOLS, AND EQUIPMENT--The student will be able to:

18.03 Use and maintain hand tools and power equipment (e.g., power saws, welders).
18.04 Maintain and service small gasoline engines.

20.0 APPLY PRINCIPLES OF AGRIBUSINESS FINANCE--The student will be able to:

20.04 Maintain and interpret supervised agricultural experience (SAE) records (e.g., depreciation, inventory, budgets).

21.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATION, AND HUMAN-RELATIONS SKILLS--The student will be able to:

21.01 Conduct group meetings using parliamentary procedure and public-speaking skills.
21.02 Identify appropriate work and personal habits. Level I.

Program: 8106400 Crop and Specialty Plant Production

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Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106830
Course Title: Agritechnology 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of job and training requirements; professional organizations; crop identification; planting crops; fertilizer calculations and application; irrigation; pest control; harvesting, packing, and grading crops, safe equipment operation; finance; and employability skills.

10.0 EXPLORE THE SCOPE OF THE AGRISCIENCE INDUSTRY--The student will be able to:

10.01 Investigate career opportunities in agriscience industries. Level II.
10.02 Describe training requirements for entry and advancement in agriscience careers. Level II.
10.03 Identify professional organizations and trade journals in the agriscience industry.

11.0 PROVIDE FOR PROPER ANIMAL HEALTH AND NUTRITION--The student will be able to:

11.01 Recognize and describe prevention and treatment of common animal diseases, disorders, and pests. Level II.
11.02 Read, interpret, and follow directions on pesticide, medication, and other additive labels.
11.05 Describe nutritional requirements of animals.
11.06 Formulate and compute least-cost feed rations.
11.07 Select growth stimulators and implants.
11.08 Determine feeding rates and methods of feeding animals.

13.0 USE PROCEDURES FOR EXHIBITING AND MARKETING ANIMALS--The student will be able to:

13.02 Collect and interpret market reports and identify market outlets for livestock.
13.03 Compare and select appropriate marketing systems.

14.0 COMPARE, SELECT, AND USE PLANT PRODUCTION SYSTEMS--The student will be able to:

14.03 Identify varieties of local commercial plants and field crops.
14.06 Calculate planting rate and spacing; solve time, distance, area, and volume problems in agriscience.
14.07 Operate and adjust planting equipment.

15.0 FERTILIZE PLANTS AND CROPS--The student will be able to:

- 15.01 Develop fertilization schedules and calculate fertilizer rates for plants; solve time, distance, area, and volume problems in agriscience.
- 15.02 Identify common nutrient-deficiency symptoms in plants.
- 15.03 Calibrate fertilization equipment and fertilize plants; solve time, distance, area, and volume problems in agriscience.

16.0 IRRIGATE PLANTS AND CROPS--The student will be able to:

- 16.01 Recognize soil and plant conditions indicating irrigation needs and develop an irrigation schedule.
- 16.02 Compare and select irrigation equipment and methods.
- 16.03 Install, operate, maintain, and repair irrigation equipment.

17.0 CONTROL PLANT PESTS--The student will be able to:

- 17.01 Identify common plant pests and their damages.
- 17.02 Describe life cycles of insects, pests, and diseases.
- 17.03 Identify the procedures and requirements for obtaining a restricted-use-pesticide operator's license.
- 17.04 Select, mix, and apply a nonrestricted chemical according to the label and local, state, federal, and EPA regulations.

18.0 OPERATE, MAINTAIN, AND SERVICE FACILITIES, TOOLS, AND EQUIPMENT--The student will be able to:

- 18.01 Demonstrate basic facility maintenance, installation, or repair.
- 18.02 Safely operate, maintain, service, and repair equipment.

19.0 DESCRIBE PROCEDURES FOR HARVESTING AND MARKETING PLANT MATERIALS--The student will be able to:

- 19.01 Determine maturity, condition, and volume of crops to be harvested.
- 19.02 Describe procedures for harvesting crops.
- 19.03 Determine kinds and types of storage facilities for crops.
- 19.04 Grade, treat, pack, and/or store harvested crop.
- 19.05 Interpret and analyze market information.
- 19.06 Compare, select, and locate marketing channels and develop a marketing program.

20.0 APPLY PRINCIPLES OF AGRIBUSINESS FINANCE--The student will be able to:

- 20.01 Identify major sources of credit for agribusiness.
- 20.02 Complete a business loan application.
- 20.03 Explain the purposes and structures of contracts, leases, deeds, and insurance policies.

21.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS, AND HUMAN-RELATIONS SKILLS--The student will be able to:

- 21.03 Identify appropriate work and personal habits. Level II.

21.04 Complete a job application.

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Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106440
Course Title: Crop Production 4
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competency in safety, fertilization, irrigation, soil preparation, seed selection, planting, farm records and problem solving.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.05 Identify possible consequences of not following safety precautions.
03.06 Follow all safety precautions when using pesticides and farming and welding equipment.

15.0 FERTILIZE PLANTS AND OR PLANT TISSUE CROPS--The student will be able to:

15.07 Determine nutrient requirements for individual crops.
15.08 Collect soil and samples for analysis and interpret results.

16.0 IRRIGATE PLANTS AND OR PLANT TISSUE--The student will be able to:

16.04 Determine irrigation requirements for a variety of crops.
16.05 Interpret water quality analysis reports.
16.06 List agencies responsible for local stream laws and ground water policies.
16.07 Operate and maintain low volume irrigation systems.
16.08 Operate, adjust and maintain volume gun and other portable irrigation equipment.
16.09 Maintain and repair permanent overhead irrigation systems.
16.10 Operate and service electric and engine driven pumps.
16.11 Keep irrigation records.

22.0 PREPARE SOIL FOR PLANTING CROPS--The student will be able to:

22.01 Identify soil texture.
22.02 Describe types of soil erosion.
22.03 Adjust tillage equipment to field conditions.
22.04 Till soil.
22.05 Evaluate and perform vegetatative and mechanical conservation practices.

23.0 SELECT SEED--The student will be able to:

23.01 Classify plants and annuals, biennials or perennials.
23.02 Interpret and evaluate a seed tag.
23.03 Evaluate and select seed and transplants.

23.04 Identify the requirements for seed certification.
25.05 Test seed for germination.

24.0 PLANT CROPS--The student will be able to:

24.01 Plant and grow a seedbed in a climate-controlled structure.
24.02 Prepare seed pieces for planting (asexual propagation).
24.03 Determine method for planting and select appropriate equipment.
24.04 Prepare seeds and plant crops.

29.0 MANAGE FARM RECORDS--The student will be able to:

29.03 Distinguish between assets and liabilities.

Program: 8106400 Crop and Speciality Plant Production

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Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number:	8106450
Course Title:	Crop Production 5
Course Credit:	1

COURSE DESCRIPTION:

This course is designed to develop competency in the area of pest management harvesting and handling plant materials, securing job information, managing farm records, and basic concepts of physics, chemistry and biology as they relate to crop production.

05.0 DESCRIBE THE PRINCIPLES OF PEST MANAGEMENT FOR INSECTS, DISEASES, AND WEEDS--The student will be able to:

05.09 Control weeds with cultivation equipment
05.10 Evaluate weed control practices for effectiveness.

08.0 EXPLAIN THE BASIC FUNCTIONS OF THE MARKETING PROCESS IN AGRICULTURE--The student will be able to:

08.03 Determine market grade requirements for various crops.
08.04 Determine how local market prices are set.
08.05 Develop a marketing program for harvested crop.

19.0 DESCRIBE PROCEDURES FOR HARVESTING AND MARKETING PLANT MATERIALS--The student will be able to:

19.07 Measure moisture content of harvested crops.
19.08 Plan harvest according to conditions and labor requirements.
19.09 Adjust harvesting equipment for specific crops.
19.10 Harvest a crop using harvesting equipment.
19.11 Monitor harvesting operations.
19.12 Protect stored crops from pests.
19.13 Keep harvest records.

21.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATION, AND HUMAN-RELATIONS SKILLS--The student will be able to:

21.06 Secure information about a job.

25.0 IDENTIFY AND SELECT VARIETIES OF ROOTSTOCK AND SCIONS FOR SELECTED SPECIALTY PLANTS--The student sill be able to:

25.01 Identify speciality plant varieties by color, shape texture and seeds.
25.02 Identify rootstock varieties for selected specialty plants.
25.03 Select roorstock varieties for selected speciality plants best suited for specific soil types, disease resistance and scion compatibility.

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25.04 Select scion varieties for selected speciality plants best suited for specific soil types, rootstock compatability, disease resistance, insect resistance, cold resistance and for specific marketing purposes.

26.0 PROPAGATE SPECIALITY PLANTS--The student will be able to:

26.01 Select and cut certified budwood.
26.02 Bud and wrap seedlings.
26.03 Grow and maintain young budded nursery stock.
26.04 Dig nursery stock for potting or prepare for bareroot shipment.
26.05 Maintain nursery sanitation.

27.0 CONTROL WEEDS, INSECTS, DISEASES AND OTHER PATHOGENS OF CROP AND SPECIALTY PLANTS--The student will be able to:

27.01 Identify noxious weeds and vines of crops and specialty plants.
27.02 Identify insects, diseases and other pathogens of crop and specialty plants.
27.03 Demonstrate the safe use of pesticides, protective clothing and respiration equipment.
27.04 Safely dispose of pesticides applicators.
27.05 Clean and maintain pesticide applicators.
27.06 Observe and maintain grove and nursery sanitation practices.

Program: 8106400 Crop and Specialty Plant Production

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106460
Course Title: Crop Production 6
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competency in the areas of tool and equipment operation and service, agribusiness finance, employability skills, management of farm records, organizing and supervising employees, the use of correct English in oral and written presentations and the construction and repair of farm facilities.

18.0 OPERATE, MAINTAIN, AND SERVICE FACILITIES, TOOLS, AND EQUIPMENT--The student will be able to:

18.05 Maintain equipment maintenance and service records.
18.06 Cut and weld with oxyacetylene and arc welding equipment.

20.0 APPLY PRINCIPLES OF AGRIBUSINESS FINANCE--The student will be able to:

20.05 Develop equitable rental and leasing agreements for land and equipment.
20.06 Prepare a case using accepted forms for obtaining credit at a lending institution.

21.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATION, AND HUMAN-RELATIONS SKILLS--The student will be able to:

21.05 Conduct a job search.
21.07 Identify documents that may be required when applying for a job.
21.08 Demonstrate competence in job interview techniques.
21.09 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
21.10 Demonstrate knowledge of how to make job changes appropriately.

28.0 PRUNE AND HEDGE SPECIALUT PLANTS--The student will be able to:

28.01 Hand prune selected specialty plants
28.02 Prune nursery trees.
28.03 Prune freeze damaged plants.
28.04 Determine appropriate time and method for hedging and topping mature citrus trees or other selected specialty plants.

29.0 MANAGE FARM RECORDS--The student will be able to

29.01 Maintain farm financial records (expense, receipts, inventories, depreciation).
29.02 Summarize farm financial records (determine gross income, net

income, enterprise income).
29.04 Maintain fertilization and pesticide application use records.
29.05 Record cultural and production information.
29.06 Determine cost and efeectiveness of cultural and management practices.
29.07 Make grove plats.
29.08 Maintain labor and personnel records.
29.09 Prepare an annual budget.
29.10 Identify sources and kinds of farm insurance.
29.11 Maintain equipment, machinery, and facilities inventory records.
29.12 Determine credit needs, cash flow needs, and returns on investments.
29.13 Secure professional services and information.

30.0 OBSERVE LAWS AND REGULATIONS REGARDING THE PLANT INDUSTRY--The student will be able to:

30.01 Observe nursey site regulations.
30.02 Know and observe quality control regulations.
30.03 Be familiar with state and federal agencies regulation the plant industry(including citrus).
30.04 Be familiar with laws regulating the movement of citrus trees, fruit, and other plant commodities.

31.0 ORGANIZE JOBS AND SUPERVISE WORKERS--The student will be able to:

31.01 Demonstrate and instruct employees in their tasks.
31.02 Enforce safety regulations.
31.03 Prepare daily work plans.
31.04 Evaluate performance of workers.
31.05 Acquire equipment and materials.

32.0 CONSTRUCT AND REPAIR FARM FACILITIES--The student will be able to:

32.01 Build and repair fences.
32.02 Form and pour concrete.
32.03 Square and build a simple farm building.
32.04 Develop a bill of materials for a construction project.

01060100CL July 1997

Florida Department of Education
CLUSTER CURRICULUM FRAMEWORK

Cluster Title: Environmental Horticulture Science And Services
Cluster Type: Job Preparatory
Occupational Area: Agriculture And Natural Resources
Components: Core, Five Programs, Eight Completion Points

	Secondary	PSAV
Grade Level	9-12, 30, 31	30, 31
Facility Code	203	203
VSO	FFA	PAS
Coop Method	Yes	Yes
Apprenticeship	Yes	Yes

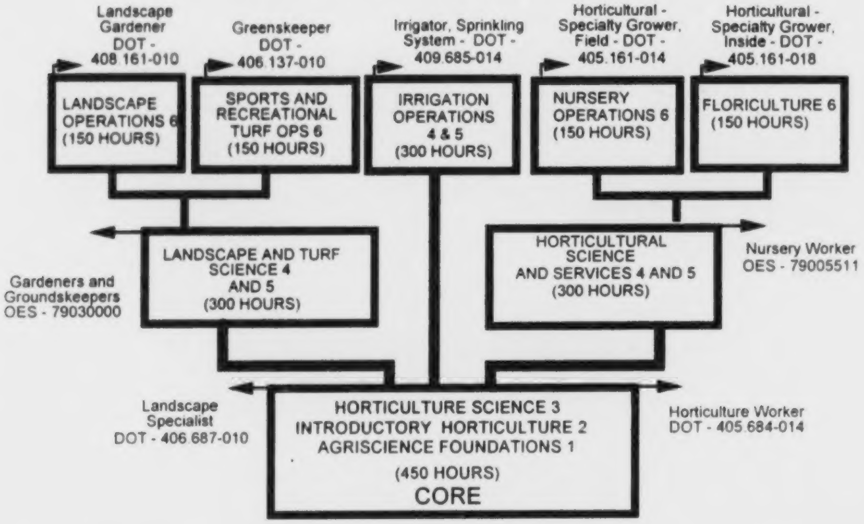
I. **PURPOSE:** The Environmental Horticulture Science and Services cluster is designed to prepare students for employment or advanced training in the horticulture and landscape industries. This cluster focuses on broad, transferrable skills and stresses understanding and demonstration of the following elements of the horticulture industry; planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues and health, safety and environmental issues. These programs also provide supplemental training for persons previously or currently employed in these occupations.

II. **CLUSTER STRUCTURE:** This cluster is a planned sequence of instruction consisting of a core, five programs and eight completion points. When the recommended sequence is followed, the structure will allow students to complete at specified points for employment or remain for advanced training. A student who completes the applicable competencies at any occupational completion point may either continue with the training program or exit as an occupational completer.

Students must complete the core, or demonstrate mastery of skills standards contained in the core, before advancing in either of the programs.

The following diagram illustrates the **CLUSTER STRUCTURE:**

ENVIRONMENTAL HORTICULTURE SCIENCE AND SERVICES CLUSTER


Landscape Gardener DOT - 408.161-010
Greenskeeper DOT - 406.137-010
Irrigator, Sprinkling System - DOT - 409.685-014
Horticultural - Specialty Grower, Field - DOT - 405.161-014
Horticultural - Specialty Grower, Inside - DOT - 405.161-018
LANDSCAPE OPERATIONS 6 (150 HOURS)
SPORTS AND RECREATIONAL TURF OPS 6 (150 HOURS)
IRRIGATION OPERATIONS 4 & 5 (300 HOURS)
NURSERY OPERATIONS 6 (150 HOURS)
FLORICULTURE 6 (150 HOURS)
Gardeners and Groundskeepers OES - 79030000
LANDSCAPE AND TURF SCIENCE 4 AND 5 (300 HOURS)
HORTICULTURAL SCIENCE AND SERVICES 4 AND 5 (300 HOURS)
Nursery Worker OES - 79005511
Landscape Specialist DOT - 406.687-010
HORTICULTURE SCIENCE 3
INTRODUCTORY HORTICULTURE 2
AGRISCIENCE FOUNDATIONS 1
(450 HOURS)
CORE
Horticulture Worker DOT - 405.684-014

When offered at the secondary level, the programs in this cluster consist of the following courses which include the core:

FLORICULTURE
    CORE
    8106810 - Agriscience Foundations 1 - 1 secondary credit
    8121510 - Introductory Horticulture 2 - 1 secondary credit
    8121520 - Horticultural Science 3 - 1 secondary credit

    8121610 - Horticulture Science and Services 4 - 1 secondary credit
    8121620 - Horticulture Science and Services 5 - 1 secondary credit

    8121010 - Floriculture 6 - 1 secondary credit

IRRIGATION OPERATIONS
    CORE
    8106810 - Agriscience Foundations 1 - 1 secondary credit
    8121510 - Introductory Horticulture 2 - 1 secondary credit
    8121520 - Horticultural Science 3 - 1 secondary credit

    8123210 - Irrigation Operations 4 - 1 secondary credit
    8123220 - Irrigation Operations 5 - 1 secondary credit

LANDSCAPE OPERATIONS

CORE

8106810 - Agriscience Foundations 1 - 1 secondary credit
8121510 - Introductory Horticulture 2 - 1 secondary credit
8121520 - Horticultural Science 3 - 1 secondary credit

8121310 - Landscape and Turf Science 4 - 1 secondary credit
8121320 - Landscape and Turf Science 5 - 1 secondary credit

8121330 - Landscape Operations 6 - 1 secondary credit

NURSERY OPERATIONS

CORE

8106810 - Agriscience Foundations 1 - 1 secondary credit
8121510 - Introductory Horticulture 2 - 1 secondary credit
8121520 - Horticultural Science 3 - 1 secondary credit

8121610 - Horticulture Science and Services 4 - 1 secondary credit
8121620 - Horticulture Science and Services 5 - 1 secondary credit

8121630 - Nursery Operations 6 - 1 secondary Credit

SPORTS AND RECREATIONAL TURF OPERATIONS

CORE

8106810 - Agriscience Foundations 1 - 1 secondary credit
8121510 - Introductory Horticulture 2 - 1 secondary credit
8121520 - Horticultural Science 3 - 1 secondary credit

8121310 - Landscape and Turf Science 4 - 1 secondary credit
8121320 - Landscape and Turf Science 5 - 1 secondary credit

8121410 - Sports and Recreational Turf Operations 6 - 1 secondary credit

III. **SPECIAL NOTE:** FFA (for secondary) and the National Postsecondary Agricultural Student Organization (for postsecondary) are the appropriate vocational student organizations for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Classroom, shop, and plant nursery/land laboratory activities are an integral part of this cluster including the general maintenance and safe use of all instructional resources.

The programs in this cluster may be offered in PSAV courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643, F.S.

Planned and supervised instructional activities must be provided through one or more of the following: (1) directed laboratory experience, (2)

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student projects, (3) placement for experience, (4) cooperative experience.

Because of the production and marketing cycle of the horticultural and landscape industries, these programs require individual instruction and supervision of students for the entire period beyond the 180-day school year.

The cooperative method of instruction is appropriate for this program. Whenever the cooperative method is offered, the following are required for each student: a training plan that is signed by the student, teacher, and employer,including instructional objectives and a list of on-the-job and in-school learning experiences and a workstation that reflects the equipment, skills, and tasks that are relevant to the occupation that the student has chosen as a career goal. The student must be paid for work performed.

In accordance with Rule 6A-10.040, FAC., the minimum basic skills grade levels required for postsecondary adult vocational students to exit the programs in this cluster are listed at the program level or at the occupational completion points within the program. These grade level numbers correspond to a grade equivalent score obtained on one of the state designated basic skills examinations. If a student does not meet the basic skills level required for completion from the program, remediation should be provided concurrently in the System for Applied Individualized Learning (SAIL) lab. Please reference the Rule for exemptions.

When a secondary student with a disability is enrolled in a vocational class with modifications to the curriculum framework, the particular outcomes and student performance standards which the student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEPs. The job title for which the student is being trained must be designated in the IEP.

SCANS Competencies: Instructional strategies for this program must include methods that require students to identify, organize, and use resources appropriately; to work with each other cooperatively and productively; to acquire and use information; to understand social, organizational, and technological systems; and to work with a variety of tools and equipment. Instructional strategies must also incorporate the methods to improve students' personal qualities and high-order thinking skills.

Equipment List: A generic equipment list is available for this program and is printed in a supplement to this document.

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Florida Department of Education
INTENDED OUTCOMES

Program Title: Floriculture Program

	Secondary	PSAV
Program Number	**8121000**	**A010603**
CIP Number	0101.060601	0101.060601
Grade Level	9-12, 30, 31	30, 31
Length	6 credits	900 hours
Certification	VOC AGRI @4	VOC AGRI @4
	AGRICULTUR 1 @2	AGRICULTUR 1 @2
	AGRI @4	AGRI @2 @4
	HORTICULT #7	HORTICULT @7 G
Basic Skills		
Math		8
Language		8
Reading		8

INTENDED OUTCOMES: After successfully completing appropriate outcomes for each occupational completion point of this program the student will be able to perform the following:

OCCUPATIONAL COMPLETION POINT - DATA CODE A
HORTICULTURE WORKER (AGRI) I - DOT Code 405.684-014 (CORE)

01.0 Describe the socioeconomic role of the agricultural industry.
02.0 Apply scientific and technological principles to the agricultural industry.
03.0 Practice agricultural safety.
04.0 Demonstrate the use of tools, equipment and instruments in the agricultural industry.
05.0 Describe the principles of integrated pest management (IPM).
06.0 Describe the principles of plant and/or animal growth and reproduction.
07.0 Apply business skills and economic principles to the agricultural industry.
08.0 Explain the basic marketing processes in the agricultural industry.
09.0 Demonstrate human relations, communications, and leadership skills.
10.0 Describe the horticulture industry.
11.0 Identify and classify plants.
12.0 Propagate plants.
13.0 Identify growing media and apply fertilizers.
14.0 Irrigate plants and turf.
15.0 Control pests.
16.0 Control plant growth.
17.0 Harvest, transport, and install plant materials.
18.0 Operate, repair, and maintain tools and equipment.
19.0 Demonstrate leadership, employability, communications, and human relations skills.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
NURSERY WORKER - OES Code 79005511

20.0 Identify and classify plants.
21.0 Control pests.
22.0 Operate, repair, and maintain tools and equipment.
23.0 Prepare growing media.
24.0 Irrigate plants.
25.0 Fertilize plant materials.
26.0 Maintain and analyze records.

OCCUPATIONAL COMPLETION POINT - DATA CODE C
HORTICULTURAL-SPECIALTY GROWER, INSIDE - DOT Code 405.161-018

27.0 Control plant growth.
28.0 Operate, repair, and maintain floriculture tools and equipment.
29.0 Evaluate growing media.
30.0 Harvest, store, package, and ship floriculture materials.
31.0 Market floriculture materials.

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Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title:	Floriculture
Secondary Number:	8121000
Postsecondary Number:	A010603

OCCUPATIONAL COMPLETION POINT - DATA CODE A

HORTICULTURE WORKER (AGRI) I - DOT Code 405.684-014 (CORE)

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.
02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.

06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.
09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

10.0 DESCRIBE THE HORTICULTURE INDUSTRY--The student will be able to:

10.01 Describe the importance of horticulture to the American and global economies.

10.02 Identify career opportunities in horticulture and educational requirements and continuing education opportunities for horticulture careers.
10.03 Describe the importance of horticulture to the environment.

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

11.01 Identify plants by scientific and common names.
11.02 Classify plants botanically and list environmental preference of plants (e.g., shade, sun, wind, moisture, salt).

12.0 PROPAGATE PLANTS--The student will be able to:

12.01 Identify propagating and growing facilities and structures.
12.02 Prepare propagation media.
12.03 Select and collect propagation materials.
12.04 Demonstrate propagation by sexual and asexual methods.
12.05 Demonstrate environmental controls for propagation materials (e.g., moisture, temperature, light).

13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:

13.01 Identify soil and media materials.
13.02 Identify nutritional needs of plants.
13.03 Identify symptoms of nutritional deficiencies and toxicities of plants.
13.04 Identify types and kinds of fertilizers.
13.05 Identify methods of distributing fertilizers.
13.06 Interpret analysis of fertilizer from information on tag or container.
13.07 Apply fertilizer and soil amendments.

14.0 IRRIGATE PLANTS AND TURF--The student will be able to:

14.01 Identify water needs of plants.
14.02 Irrigate plants at recommended rates.

15.0 CONTROL PESTS--The student will be able to:

15.01 Identify common pests of plants (e.g., diseases, weeds, nematodes).
15.02 Describe life cycles of common pests of plants.
15.03 Classify insects according to feeding habits.
15.04 Describe biological, chemical, and cultural methods of controlling plant pests.

16.0 CONTROL PLANT GROWTH--The student will be able to:

16.01 Identify methods of pruning plants to achieve desired growth and to maintain health.
16.02 Identify appropriate time to prune plants.
16.03 Identify and select pruning tools for the task.

17.0 HARVEST, TRANSPORT, AND INSTALL PLANT MATERIALS--The student will be able to:

17.01 Determine requirements for preserving plant viability.
17.02 Install containerized plant materials.
17 03 Select and prepare plants for transportation and transplanting

18.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

18.01 Perform equipment preoperational check.
18.02 Identify, maintain, and safely operate hand tools and power tools.

19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:

19.01 Conduct group meetings, using parliamentary procedure and public speaking skills.
19.02 Identify acceptable work habits and personal characteristics.
19.03 Identify acceptable employee hygiene habits.
19.04 Identify or demonstrate appropriate responses to criticism fro employer, supervisor, or other persons.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
NURSERY WORKER - OES Code 79005505

20.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

20.01 Classify plants as monocots or dicots.
20.02 Classify plants as annuals, biennials, and perennials.
20.03 Identify plants appropriate to a region.
20.04 Classify plants according to growth habit.
20.05 Prepare propagation materials (seeds, cuttings, etc.) for planting.
20.06 Apply growth stimulants to propagation materials.
20.07 Demonstrate sanitation and safety practices when propagating.
20.08 Prepare flats and seedbeds and plant seeds.

21.0 CONTROL PESTS--The student will be able to:

21.01 Report insect and disease damage.
21.02 Identify chemical spray damage.
21.03 Select proper IPM practices (biological, chemical and physical for control of insects, diseases, vertebrates and weeds.
21.04 Evaluate the efficacy and phytotoxicity of a chemical prior to inclusion in a growing program.

22.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

22.01 Identify, operate, and maintain tractor and power equipment.
22.02 Load, secure, and transport equipment.

23.0 PREPARE GROWING MEDIA--The student will be able to:

- 23.01 Sterilize rooting, potting, and growing media.
- 23.02 Adjust pH and nutritional levels of media.
- 23.03 Fill and level benches and pots with media.
- 23.04 Demonstrate sanitation practices when handling and storing plant media materials.

24.0 IRRIGATE PLANTS--The student will be able to:

- 24.01 Set up an irrigation system for a propagation area.
- 24.02 Set up an irrigation system for a growing structure.
- 24.03 Set up an irrigation system for a retail display.
- 24.04 Maintain and repair an irrigation system.
- 24.05 Identify and use various types of irrigation systems (low volume, ebb and flow, drip, mat, recirculating, etc.).

25.0 FERTILIZE PLANT MATERIALS--The student will be able to:

- 25.01 Collect soil and leaf tissue samples for analysis.
- 25.02 Interpret and evaluate the results of soil and leaf tissue analysis and determine corrective actions.
- 25.03 Demonstrate proper handling and storage of fertilizers, observing safety precautions.
- 25.04 Evaluate, operate, and maintain fertilizer distribution equipment.
- 25.05 Develop a fertilization schedule for various plant species.
- 25.06 Determine rate of fertilizer application.

26.0 MAINTAIN AND ANALYZE RECORDS--The student will be able to:

- 26.01 Analyze and maintain production and sales records.
- 26.02 Determine plant production costs.
- 26.03 Prepare a budget.
- 26.04 Prepare and maintain financial records using computer software.
- 26.05 Maintain current plant inventory.
- 26.06 Maintain job records, daily log sheets, and inventory.

OCCUPATIONAL COMPLETION POINT - DATA CODE C
HORTICULTURAL-SPECIALTY GROWER, INSIDE - DOT Code 405.161-018

27.0 CONTROL PLANT GROWTH--The student will be able to:

- 27.01 Pinch and disbud flowering plants.
- 27.02 Apply growth regulating chemicals.
- 27.03 Install black cloth to regulate photoperiod.
- 27.04 Prune plants to achieve desired growth.
- 27.05 Regulate light levels in growing structures.

28.0 OPERATE, REPAIR, AND MAINTAIN FLORICULTURE TOOLS AND EQUIPMENT--The student will be able to:

- 28.01 Determine equipment needs for the job.
- 28.02 Maintain and repair electric motors and equipment.

28.03 Order parts and supplies.
28.04 Build or repair frames, benches, and other greenhouse or field structures.

29.0 EVALUATE GROWING MEDIA--The student will be able to:

29.01 Evaluate commercial media and containers.

30.0 HARVEST, STORE, PACKAGE, AND SHIP FLORICULTURE MATERIALS--The student will be able to:

30.01 Select and assemble floriculture materials utilizing industry accepted grades and standards.
30.02 Cut, count and bunch cut flowers and other plant materials.
30.03 Prepare for shipment, loading, and transporting harvested plant materials.
30.04 Demonstrate safety practices when harvesting, processing, and shipping.
30.05 Determine proper packaging and environment for plant transportation.

31.0 MARKET FLORICULTURE MATERIALS--The student will be able to:

31.01 Label and merchandise floriculture materials including plant care tags, bar codes, shipping instructions, etc.
31.02 Maintain clean and attractive merchandising and display areas.
31.03 Use various advertising methods to promote sales.
31.04 Take telephone orders.
31.05 Use a sales catalog.
31.06 Greet customers and close sales.
31.07 Describe care and use of product to customer.

Program: 8121000 Floriculture

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number:	8106810
Course Title:	Agriscience Foundations I
Course Credit:	1

COURSE DESCRIPTION:

This course was developed as a core and is designed to develop competencies in the areas of agricultural history; global importance of agriculture; career opportunities; applied scientific and technological concepts; ecosystems; agricultural safety; principles of integrated pest management; principles of plant and animal growth; economic principles; agricultural marketing; and human relations skills.

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.

02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.

09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121510
Course Title: Introductory Horticulture 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of career opportunities; global importance of agriculture; plant classification; propagation; growing media; nutritional needs; fertilization; irrigation; pest identification; pest control, pruning; plant installation; transplanting; safe hand-tool use; and employability skills.

10.0 DESCRIBE THE HORTICULTURE INDUSTRY--The student will be able to:

- 10.01 Describe the importance of horticulture to the American and global economies.
- 10.02 Identify career opportunities in horticulture and educational requirements and continuing education opportunities for horticulture careers.
- 10.03 Describe the importance of horticulture to the environment.

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

- 11.01 Identify plants by scientific and common names. Level I.
- 11.02 Classify plants botanically and list environmental preference of plants (e.g., shade, sun, wind, moisture, salt). Level I.

12.0 PROPAGATE PLANTS--The student will be able to:

- 12.01 Identify propagating and growing facilities and structures.
- 12.02 Prepare propagation media.
- 12.03 Select and collect propagation materials.
- 12.04 Demonstrate propagation by sexual and asexual methods.
- 12.05 Demonstrate environmental controls for propagation materials (e.g., moisture, temperature, light).

13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:

- 13.01 Identify soil and media materials.
- 13.02 Identify nutritional needs of plants.
- 13.03 Identify symptoms of nutritional deficiencies and toxicities of plants.
- 13.04 Identify types and kinds of fertilizers.
- 13.05 Identify methods of distributing fertilizers.

14.0 IRRIGATE PLANTS AND TURF--The student will be able to:

- 14.01 Identify water needs of plants.

14.02 Irrigate plants at recommended rates.

15.0 CONTROL PESTS--The student will be able to:

15.01 Identify common pests of plants (e.g., diseases, weeds, nematodes).

15.02 Describe life cycles of common pests of plants.

19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:

19.01 Conduct group meetings, using parliamentary procedure and public speaking skills.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121520
Course Title: Horticulture Science 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of industry regulations; plant classification; plant transportation; soil sampling and analysis; fertilizer calculations; recording keeping; irrigation components, water quality; drainage; integrated pest management; pesticide safety and regulations; equipment calibration; chemical growth regulators; xeriscaping; integrated landscape management; safe use of power equipment; record keeping; and employability skills.

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

11.01 Identify plants by scientific and common names.
11.02 Classify plants botanically and list environmental preference of plants (e.g., shade, sun, wind, moisture, salt).

13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:

13.06 Interpret analysis of fertilizer from information on tag or container.
13.07 Apply fertilizer and soil amendments.

15.0 CONTROL PESTS--The student will be able to:

15.03 Classify insects according to feeding habits.
15.04 Describe biological, chemical, and cultural methods of controlling plant pests.

16.0 CONTROL PLANT GROWTH--The student will be able to:

16.01 Identify methods of pruning plants to achieve desired growth and to maintain health.
16.02 Identify appropriate time to prune plants.
16.03 Identify and select pruning tools for the task.

17.0 HARVEST, TRANSPORT, AND INSTALL PLANT MATERIALS--The student will be able to:

17.01 Determine requirements for preserving plant viability.
17.02 Install containerized plant materials.
17.03 Select and prepare plants for transportation and transplanting.

18.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

18.01 Perform equipment preoperational check.

18.02 Identify, maintain, and safely operate hand tools and power tools.

19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:

19.02 Identify acceptable work habits and personal characteristics.

19.03 Identify acceptable employee hygiene habits.

19.04 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.

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Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121610
Course Title: Horticulture Science and Services 4
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of plant identification and classification; growing media; irrigation system set up; and maintaining and analyzing records including production costs.

20.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

20.01 Classify plants as monocots or dicots.
20.02 Classify plants as annuals, biennials, and perennials.
20.03 Identify plants appropriate to a region.
20.04 Classify plants according to growth habit.
20.05 Prepare propagation materials (seeds, cuttings, etc.) for planting.
20.06 Apply growth stimulants to propagation materials.
20.07 Demonstrate sanitation and safety practices when propagating.
20.08 Prepare flats and seedbeds and plant seeds.

22.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

22.01 Identify, operate, and maintain tractor and power equipment.
22.02 Load, secure, and transport equipment.

23.0 PREPARE GROWING MEDIA--The student will be able to:

23.01 Sterilize rooting, potting, and growing media.
23.02 Adjust pH and nutritional levels of media.
23.03 Fill and level benches and pots with media.
23.04 Demonstrate sanitation practices when handling and storing plant media materials.

24.0 IRRIGATE PLANTS--The student will be able to:

24.01 Set up an irrigation system for a propagation area.
24.02 Set up an irrigation system for a growing structure.
24.03 Set up an irrigation system for a retail display.

26.0 MAINTAIN AND ANALYZE RECORDS--The student will be able to:

26.01 Analyze and maintain production and sales records.
26.02 Determine plant production costs.
26.03 Prepare a budget.
26.04 Prepare and maintain financial records using computer software.
26.05 Maintain current plant inventory.

26.06 Maintain job records, daily log sheets, and inventory.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121620
Course Title: Horticulture Science and Services 5
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of identifying and evaluating IPM practices; maintaining and repairing irrigation systems; analyzing and evaluating fertilizer usage.

21.0 CONTROL PESTS--The student will be able to:

21.01 Report insect and disease damage.
21.02 Identify chemical spray damage.
21.03 Select proper IPM practices (biological, chemical and physical) for control of insects, diseases, vertebrates and weeds.
21.04 Evaluate the efficacy and phytotoxicity of a chemical prior to inclusion in a growing program.

24.0 IRRIGATE PLANTS--The student will be able to:

24.04 Maintain and repair an irrigation system.
24.05 Identify and use various types of irrigation systems (low volume, ebb and flow, drip, mat, recirculating, etc.).

25.0 FERTILIZE PLANT MATERIALS--The student will be able to:

25.01 Collect soil and leaf tissue samples for analysis.
25.02 Interpret and evaluate the results of soil and leaf tissue analysis and determine corrective actions.
25.03 Demonstrate proper handling and storage of fertilizers, observing safety precautions.
25.04 Evaluate, operate, and maintain fertilizer distribution equipment.
25.05 Develop a fertilization schedule for various plant species.
25.06 Determine rate of fertilizer application.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121010
Course Title: Floriculture 6
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of controlling plant growth; use and maintenance of floriculture tools and equipment; harvesting, packaging, and shipping floriculture materials; and marketing.

27.0 CONTROL PLANT GROWTH--The student will be able to:

27.01 Pinch and disbud flowering plants.
27.02 Apply growth regulating chemicals.
27.03 Install black cloth to regulate photoperiod.
27.04 Prune plants to achieve desired growth.
27.05 Regulate light levels in growing structures.

28.0 OPERATE, REPAIR, AND MAINTAIN FLORICULTURE TOOLS AND EQUIPMENT--The student will be able to:

28.01 Determine equipment needs for the job.
28.02 Maintain and repair electric motors and equipment.
28.03 Order parts and supplies.
28.04 Build or repair frames, benches, and other greenhouse or field structures.

29.0 EVALUATE GROWING MEDIA--The student will be able to:

29.01 Evaluate commercial media and containers.

30.0 HARVEST, STORE, PACKAGE, AND SHIP FLORICULTURE MATERIALS--The student will be able to:

30.01 Select and assemble floriculture materials utilizing industry accepted grades and standards.
30.02 Cut, count and bunch cut flowers and other plant materials.
30.03 Prepare for shipment, loading, and transporting harvested plant materials.
30.04 Demonstrate safety practices when harvesting, processing, and shipping.
30.05 Determine proper packaging and environment for plant transportation.

31.0 MARKET FLORICULTURE MATERIALS--The student will be able to:

31.01 Label and merchandise floriculture materials including plant care tags, bar codes, shipping instructions, etc.

31.02 Maintain clean and attractive merchandising and display areas.
31.03 Use various advertising methods to promote sales.
31.04 Take telephone orders.
31.05 Use a sales catalog.
31.06 Greet customers and close sales.
31.07 Describe care and use of product to customer.

July 1997

Florida Department of Education
INTENDED OUTCOMES

Program Title: **Irrigation Operations Program**

	SECONDARY	PSAV
Program Number	**8123200**	**A010206**
CIP Number	0101.020600	0101.020600
Grade Level	9-12, 30, 31	30, 31
Length	5 credits	750 hours
Certification	VOC AGRI @4	VOC AGRI @4
	AGRICULTUR 1 @2	AGRICULTUR 1 @2
	AGRI @4	AGRI @2 @4
	HORTICULT #7	HORTICULT @7 G
Basic Skills		
Math		8
Language		8
Reading		8

INTENDED OUTCOMES: After successfully completing appropriate outcomes for each occupational completion point of this program the student will be able to perform the following:

OCCUPATIONAL COMPLETION POINT - DATA CODE A
HORTICULTURE WORKER (AGRI) I - DOT Code 405.684-014 (CORE)

01.0 Describe the socioeconomic role of the agricultural industry.
02.0 Apply scientific and technological principles to the agricultural industry.
03.0 Practice agricultural safety.
04.0 Demonstrate the use of tools, equipment and instruments in the agricultural industry.
05.0 Describe the principles of integrated pest management (IPM).
06.0 Describe the principles of plant and/or animal growth and reproduction.
07.0 Apply business skills and economic principles to the agricultural industry.
08.0 Explain the basic marketing processes in the agricultural industry.
09.0 Demonstrate human relations, communications, and leadership skills.
10.0 Describe the horticulture industry.
11.0 Identify and classify plants.
12.0 Propagate plants.
13.0 Identify growing media and apply fertilizers.
14.0 Irrigate plants and turf.
15.0 Control pests.
16.0 Control plant growth.
17.0 Harvest, transport, and install plant materials.
18.0 Operate, repair, and maintain tools and equipment.
19.0 Demonstrate leadership, employability, communications, and human relations skills.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
IRRIGATOR, SPRINKLING SYSTEM (AGRI) - DOT Code 409.685-014

20.0 Identify irrigation system types and water sources.
21.0 Install piping and heads.
22.0 Install valves, timers, rain shut-offs, moisture sensors, and suction lines.
23.0 Test irrigation systems.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Irrigation Operations
Secondary Number: 8123200
Postsecondary Number: A010206

OCCUPATIONAL COMPLETION POINT - DATA CODE A
HORTICULTURE WORKER (AGRI) I - DOT Code 405.684-014 (CORE)

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.
02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.

06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.
09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

10.0 DESCRIBE THE HORTICULTURE INDUSTRY--The student will be able to:

10.01 Describe the importance of horticulture to the American and global economies.
10.02 Identify career opportunities in horticulture and educational requirements and continuing education opportunities for horticulture careers.
10.03 Describe the importance of horticulture to the environment.

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

11.01 Identify plants by scientific and common names.
11.02 Classify plants botanically and list environmental preference of plants (e.g., shade, sun, wind, moisture, salt).

12.0 PROPAGATE PLANTS--The student will be able to:

12.01 Identify propagating and growing facilities and structures.
12.02 Prepare propagation media.
12.03 Select and collect propagation materials.
12.04 Demonstrate propagation by sexual and asexual methods.
12.05 Demonstrate environmental controls for propagation materials (e.g., moisture, temperature, light).

13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:

13.01 Identify soil and media materials.
13.02 Identify nutritional needs of plants.
13.03 Identify symptoms of nutritional deficiencies and toxicities of plants.
13.04 Identify types and kinds of fertilizers.
13.05 Identify methods of distributing fertilizers.
13.06 Interpret analysis of fertilizer from information on tag or container.
13.07 Apply fertilizer and soil amendments.

14.0 IRRIGATE PLANTS AND TURF--The student will be able to:

14.01 Identify water needs of plants.
14.02 Irrigate plants at recommended rates.

15.0 CONTROL PESTS--The student will be able to:

15.01 Identify common pests of plants (e.g., diseases, weeds, nematodes).
15.02 Describe life cycles of common pests of plants.
15.03 Classify insects according to feeding habits.
15.04 Describe biological, chemical, and cultural methods of controlling plant pests.

16.0 CONTROL PLANT GROWTH--The student will be able to:

16.01 Identify methods of pruning plants to achieve desired growth and to maintain health.
16.02 Identify appropriate time to prune plants.

16.03 Identify and select pruning tools for the task.

17.0 HARVEST, TRANSPORT, AND INSTALL PLANT MATERIALS--The student will be able to:

17.01 Determine requirements for preserving plant viability.
17.02 Install containerized plant materials.
17.03 Select and prepare plants for transportation and transplanting.

18.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

18.01 Perform equipment preoperational check.
18.02 Identify, maintain, and safely operate hand tools and power tools.

19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:

19.01 Conduct group meetings, using parliamentary procedure and public speaking skills.
19.02 Identify acceptable work habits and personal characteristics.
19.03 Identify acceptable employee hygiene habits.
19.04 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
IRRIGATOR, SPRINKLING SYSTEM (AGRI) - DOT Code 409.685-014

20.0 IDENTIFY IRRIGATION SYSTEM TYPES AND WATER SOURCES--The student will be able to:

20.01 Identify various water sources used for irrigation.
20.02 Identify various irrigation system types (i.e., rotary, spray, flood, drip).
20.03 Identify various control systems for irrigation (i.e., electric, hydraulic, manual).
20.04 Determine various pump types and their functions (i.e., centrifugal, turbine, submersible).
20.05 Identify various water conservation systems and xeriscape principles used in irrigation.
20.06 Describe concepts of zoning, precipitation rates, pressure, volume, and velocity.

21.0 INSTALL PIPING AND HEADS--The student will be able to:

21.01 Operate a trencher and install trenching for main and lateral lines.
21.02 Backfill and compact trenches.
21.03 Install PVC and galvanized pipe sleeving.
21.04 Measure, cut, clean, prime, and glue PVC pipe (up to 3").
21.05 Glue and assemble fitting and pipe and swing joints.
21.06 Identify and install low voltage direct burial wiring.
21.07 Install heads--rotary, spray, and quick coupler.

21.08 Install head nozzles, adjust flow rates, set radius and patterns of coverage.

22.0 INSTALL VALVES, TIMERS, RAIN SHUT-OFFS, MOISTURE SENSORS AND SUCTION LINES--The student will be able to:

22.01 Install plastic and brass valves (up to 3").
22.02 Install control timers and connect to master valve or pumping systems (low voltage only).
22.03 Install various rain shut-offs.
22.04 Install various moisture sensors.
22.05 Install pump suction lines and associated equipment.

23.0 TEST IRRIGATION SYSTEM--The student will be able to:

23.01 Use a moisture meter.
23.02 Read a pressure gauge and perform system pressure testing.
23.03 Read and record data from flow meters.
23.04 Calculate water times and duration and set time controller timing.
23.05 Remove, clean and reinstall heads.
23.06 Repair PVC pipe breaks.
23.07 Splice low voltage wiring and repair hydraulic tubing.
23.08 Repressurize piping systems.
23.09 Reprime centrifugal pumps.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106810
Course Title: Agriscience Foundations I
Course Credit: 1

COURSE DESCRIPTION:

This course was developed as a core and is designed to develop competencies in the areas of agricultural history; global importance of agriculture; career opportunities; applied scientific and technological concepts; ecosystems; agricultural safety; principles of integrated pest management; principles of plant and animal growth; economic principles; agricultural marketing; and human relations skills.

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.

02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.

09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121510
Course Title: Introductory Horticulture 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of career opportunities; global importance of agriculture; plant classification; propagation; growing media; nutritional needs; fertilization; irrigation; pest identification; pest control, pruning; plant installation; transplanting; safe hand-tool use; and employability skills.

10.0 DESCRIBE THE HORTICULTURE INDUSTRY--The student will be able to:

- 10.01 Describe the importance of horticulture to the American and global economies.
- 10.02 Identify career opportunities in horticulture and educational requirements and continuing education opportunities for horticulture careers.
- 10.03 Describe the importance of horticulture to the environment.

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

- 11.01 Identify plants by scientific and common names. Level I.
- 11.02 Classify plants botanically and list environmental preference of plants (e.g., shade, sun, wind, moisture, salt). Level I.

12.0 PROPAGATE PLANTS--The student will be able to:

- 12.01 Identify propagating and growing facilities and structures.
- 12.02 Prepare propagation media.
- 12.03 Select and collect propagation materials.
- 12.04 Demonstrate propagation by sexual and asexual methods.
- 12.05 Demonstrate environmental controls for propagation materials (e.g., moisture, temperature, light).

13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:

- 13.01 Identify soil and media materials.
- 13.02 Identify nutritional needs of plants.
- 13.03 Identify symptoms of nutritional deficiencies and toxicities of plants.
- 13.04 Identify types and kinds of fertilizers.
- 13.05 Identify methods of distributing fertilizers.

14.0 IRRIGATE PLANTS AND TURF--The student will be able to:

- 14.01 Identify water needs of plants.

14.02 Irrigate plants at recommended rates.

15.0 CONTROL PESTS--The student will be able to:

15.01 Identify common pests of plants (e.g., diseases, weeds, nematodes).
15.02 Describe life cycles of common pests of plants.

19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:

19.01 Conduct group meetings, using parliamentary procedure and public speaking skills.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number:	8121520
Course Title:	Horticulture Science 3
Course Credit:	1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of industry regulations; plant classification; plant transportation; soil sampling and analysis; fertilizer calculations; recording keeping; irrigation components, water quality; drainage; integrated pest management; pesticide safety and regulations; equipment calibration; chemical growth regulators; xeriscaping; integrated landscape management; safe use of power equipment; record keeping; and employability skills.

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

11.01 Identify plants by scientific and common names.
11.02 Classify plants botanically and list environmental preference of plants (e.g., shade, sun, wind, moisture, salt).

13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:

13.06 Interpret analysis of fertilizer from information on tag or container.
13.07 Apply fertilizer and soil amendments.

15.0 CONTROL PESTS--The student will be able to:

15.03 Classify insects according to feeding habits.
15.04 Describe biological, chemical, and cultural methods of controlling plant pests.

16.0 CONTROL PLANT GROWTH--The student will be able to:

16.01 Identify methods of pruning plants to achieve desired growth and to maintain health.
16.02 Identify appropriate time to prune plants.
16.03 Identify and select pruning tools for the task.

17.0 HARVEST, TRANSPORT, AND INSTALL PLANT MATERIALS--The student will be able to:

17.01 Determine requirements for preserving plant viability.
17.02 Install containerized plant materials.
17.03 Select and prepare plants for transportation and transplanting.

18.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

18.01 Perform equipment preoperational check.
18.02 Identify, maintain, and safely operate hand tools and power tools.

19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:

19.02 Identify acceptable work habits and personal characteristics.
19.03 Identify acceptable employee hygiene habits.
19.04 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8123210
Course Title: Irrigation Operations 4
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of irrigation systems including water sources, zoning, and installation of systems.

20.0 IDENTIFY IRRIGATION SYSTEM TYPES AND WATER SOURCES--The student will be able to:

20.01 Identify various water sources used for irrigation.
20.02 Identify various irrigation system types (i.e., rotary, spray, flood, drip).
20.03 Identify various control systems for irrigation (i.e., electric, hydraulic, manual).
20.04 Determine various pump types and their functions (i.e., centrifugal, turbine, submersible).
20.05 Identify various water conservation systems and xeriscape principles used in irrigation.
20.06 Describe concepts of zoning, precipitation rates, pressure, volume, and velocity.

21.0 INSTALL PIPING AND HEADS--The student will be able to:

21.01 Operate a trencher and install trenching for main and lateral lines.
21.02 Backfill and compact trenches.
21.03 Install PVC and galvanized pipe sleeving.
21.04 Measure, cut, clean, prime, and glue PVC pipe (up to 3").
21.05 Glue and assemble fitting and pipe and swing joints.
21.06 Identify and install low voltage direct burial wiring.
21.07 Install heads - rotary, spray, and quick coupler.
21.08 Install head nozzles, adjust flow rates, set radius and patterns of coverage.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8123220
Course Title: Irrigation Operations 5
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the area of irrigation systems including installation of valves, timers, moisture sensors and testing systems.

22.0 INSTALL VALVES, TIMERS, RAIN SHUT-OFFS, MOISTURE SENSORS AND SUCTION LINES--The student will be able to:

22.01 Install plastic and brass valves (up to 3").
22.02 Install control timers and connect to master valve or pumping systems (low voltage only).
22.03 Install various rain shut-offs.
22.04 Install various moisture sensors.
22.05 Install pump suction lines and associated equipment.

23.0 TEST IRRIGATION SYSTEM--The student will be able to:

23.01 Use a moisture meter.
23.02 Read a pressure gauge and perform system pressure testing.
23.03 Read and record data from flow meters.
23.04 Calculate water times and duration and set time controller timing.
23.05 Remove, clean and reinstall heads.
23.06 Repair PVC pipe breaks.
23.07 Splice low voltage wiring and repair hydraulic tubing.
23.08 Repressurize piping systems.
23.09 Reprime centrifugal pumps.

Florida Department of Education
INTENDED OUTCOMES

Program Title: Landscape Operations

	SECONDARY	PSAV
Program Number	**8121300**	**A010615**
CIP Number	0101.060510	0101.060510
Grade Level	9-12, 30, 31	30, 31
Length	6 credits	900 hours
Certification	VOC AGRI @4	VOC AGRI @4
	AGRICULTUR 1 @2	AGRICULTUR 1 @2
	AGRI @4	AGRI @2 @4
	HORTICULT #7	HORTICULT @7 G
Basic Skills		
Math		8
Language		8
Reading		8

INTENDED OUTCOMES: After successfully completing appropriate outcomes for each occupational completion point of this program the student will be able to perform the following:

OCCUPATIONAL COMPLETION POINT - DATA CODE A
LANDSCAPE SPECIALIST - DOT Code 406.687-010

01.0 Describe the socioeconomic role of the agricultural industry.
02.0 Apply scientific and technological principles to the agricultural industry.
03.0 Practice agricultural safety.
04.0 Demonstrate the use of tools, equipment and instruments in the agricultural industry.
05.0 Describe the principles of integrated pest management (IPM).
06.0 Describe the principles of plant and/or animal growth and reproduction.
07.0 Apply business skills and economic principles to the agricultural industry.
08.0 Explain the basic marketing processes in the agricultural industry.
09.0 Demonstrate human relations, communications, and leadership skills.
10.0 Describe the horticulture industry.
11.0 Identify and classify plants.
12.0 Propagate plants.
13.0 Identify growing media and apply fertilizers.
14.0 Irrigate plants and turf.
15.0 Control pests.
16.0 Control plant growth.
17.0 Harvest, transport, and install plant materials.
18.0 Operate, repair, and maintain tools and equipment
19.0 Demonstrate leadership, employability, communications, and human relations skills.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
GARDENERS AND GROUNDSKEEPERS - OES Code 79030000

20.0 Maintain tools and equipment.
21.0 Apply chemical and calibrate spray equipment.
22.0 Classify plants and turfgrass.
23.0 Demonstrate fertilization skills.
24.0 Irrigate plants and turf.
25.0 Analyze and design landscape and turf.
26.0 Prepare estimates, contracts, and presentation.
27.0 Lay out and install landscape and turf.

OCCUPATIONAL COMPLETION POINT - DATA CODE C
LANDSCAPE GARDENER - DOT Code 408.161-010

28.0 Lay out and install landscape and interiorscape.
29.0 Maintain landscape.
30.0 Maintain customer relations and observe follow-up procedures.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title:	Landscape Operations
Secondary Number:	8121300
Postsecondary Number:	A010615

OCCUPATIONAL COMPLETION POINT - DATA CODE A
GROUNDSKEEPER, PARKS AND GROUNDS - DOT Code 407.687-010

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.
02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.

06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.
09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

10.0 DESCRIBE THE HORTICULTURE INDUSTRY--The student will be able to:

10.01 Describe the importance of horticulture to the American and global economies.

10.02 Identify career opportunities in horticulture and educational requirements and continuing education opportunities for horticulture careers.
10.03 Describe the importance of horticulture to the environment.

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

11.01 Identify plants by scientific and common names.
11.02 Classify plants botanically and list environmental preference of plants (e.g., shade, sun, wind, moisture, salt).

12.0 PROPAGATE PLANTS--The student will be able to:

12.01 Identify propagating and growing facilities and structures.
12.02 Prepare propagation media.
12.03 Select and collect propagation materials.
12.04 Demonstrate propagation by sexual and asexual methods.
12.05 Demonstrate environmental controls for propagation materials (e.g., moisture, temperature, light).

13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:

13.01 Identify soil and media materials.
13.02 Identify nutritional needs of plants.
13.03 Identify symptoms of nutritional deficiencies and toxicities of plants.
13.04 Identify types and kinds of fertilizers.
13.05 Identify methods of distributing fertilizers.
13.06 Interpret analysis of fertilizer from information on tag or container.
13.07 Apply fertilizer and soil amendments.

14.0 IRRIGATE PLANTS AND TURF--The student will be able to:

14.01 Identify water needs of plants.
14.02 Irrigate plants at recommended rates.

15.0 CONTROL PESTS--The student will be able to:

15.01 Identify common pests of plants (e.g., diseases, weeds, nematodes).
15.02 Describe life cycles of common pests of plants.
15.03 Classify insects according to feeding habits.
15.04 Describe biological, chemical, and cultural methods of controlling plant pests.

16.0 CONTROL PLANT GROWTH--The student will be able to:

16.01 Identify methods of pruning plants to achieve desired growth and to maintain health.
16.02 Identify appropriate time to prune plants.
16.03 Identify and select pruning tools for the task.

17.0 HARVEST, TRANSPORT, AND INSTALL PLANT MATERIALS--The student will be able to:

17.01 Determine requirements for preserving plant viability.
17.02 Install containerized plant materials.
17.03 Select and prepare plants for transportation and transplanting.

18.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

18.01 Perform equipment preoperational check.
18.02 Identify, maintain, and safely operate hand tools and power tools.

19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:

19.01 Conduct group meetings, using parliamentary procedure and public speaking skills.
19.02 Identify acceptable work habits and personal characteristics.
19.03 Identify acceptable employee hygiene habits.
19.04 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
GARDENERS AND GROUNDSKEEPERS - OES Code 79014524

20.0 MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

20.01 Maintain oil level in engines of power equipment.
20.02 Check and maintain tire air pressure on equipment.
20.03 Maintain fuel levels using proper fuel or fuel mixtures.
20.04 Operate manual transmissions.
20.05 Identify, operate, and maintain tractor and power equipment.
20.06 Service and maintain battery and electrical systems.
20.07 Perform minor tune-up on engines.
20.08 Load, secure, and transport equipment.
20.09 Demonstrate safety precautions while working with tools and equipment.

21.0 APPLY CHEMICAL AND CALIBRATE SPRAY EQUIPMENT--The student will be able to:

21.01 Select, mix, and apply a nonrestricted chemical, according to the label and local, state, federal, and EPA regulations.
21.02 Calibrate spray and spread equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.
21.03 Identify and report insect and disease damage.
21.04 Determine chemical compatibility.
21.05 Determine appropriate time frequency and method of chemical application.

22.0 CLASSIFY PLANTS AND TURFGRASS--The student will be able to:

22.01 Classify plants as monocots or dicots.
22.02 Classify plants and turfgrass as annuals, biennials, and perennials.
22.03 Identify plants and turfgrass that are specific to a region.
22.04 Classify plants and turfgrass according to growth habit.
22.05 Identify poisonous plants.

23.0 DEMONSTRATE FERTILIZATION SKILLS--The students will be able to:

23.01 Develop a fertilization schedule.
23.02 Determine rate of fertilizer application and calibration equipment.
23.03 Calibrate fertilizer equipment.

24.0 IRRIGATE PLANTS AND TURF--The student will be able to:

24.01 Identify various types of irrigation systems.
24.02 Install piping and water distribution components.
24.03 Install valves, timers, rain shut-offs, moisture sensors, and back flow prevention devices.
24.04 Check and evaluate irrigation system performance.

25.0 ANALYZE AND DESIGN LANDSCAPE AND TURF--The student will be able to:

25.01 Analyze and interpret plans, specifications, and environmental conditions of the project.
25.02 Design the project.
25.03 Identify and locate project materials.
25.04 Determine personnel and equipment needs and safety requirements for the project.
25.05 Establish project schedule.

26.0 PREPARE ESTIMATES, CONTRACTS, AND PRESENTATION--The student will be able to:

26.01 Determine costs of materials, equipment, and labor.
26.02 Prepare a price for the project and terms of contract.
26.03 Prepare written contract, using standard rules of English including punctuation, spelling, sentence structure and references.
26.04 Prepare and give oral presentation of the project design, using standard rules of English including punctuation and sentence structure.
26.05 Maintain job records, daily log sheets, and inventory.

27.0 LAY OUT AND INSTALL LANDSCAPE, INTERIORSCAPE, AND TURF--The student will be able to:

27.01 Locate existing utilities and secure a permit.
27.02 Prepare and rough grade the site.
27.03 Determine procedures for installation of large materials.
27.04 Install and test irrigation system.

27.05 Describe procedures for constructing hardscape (walls, walks, patios, drives, etc.).

OCCUPATIONAL COMPLETION POINT - DATA CODE C
LANDSCAPE GARDENER - DOT Code 408.161-010

28.0 LAY OUT AND INSTALL LANDSCAPE AND INTERIORSCAPE--The student will be able to:

28.01 Layout and install plants.
28.02 Prepare landscape and interiorscape.
28.03 Prepare final grade.
28.04 Layout and install plants and turf.
28.05 Install mulch and perform final cleanup.

29.0 MAINTAIN LANDSCAPE--The student will be able to:

29.01 Perform maintenance inspection of the project.
29.02 Determine water requirements and apply at proper rates.
29.03 Identify weeds and apply herbicides safely.
29.04 Determine fertilization requirements and apply at proper rates.
29.05 Identify plant pest and disease problems and apply corrective measures.
29.06 Trim and prune landscape plants.
29.07 Maintain turf viability; mow at proper height and frequency, blade edge, line trim, and remove trash.
29.08 Explain cause and effect of soil compaction and thatch buildups, and determine appropriate methods of correction.
29.09 Cultivate and mulch plants.
29.10 Brace and repair trees.
29.11 Provide protection for plants from adverse weather conditions.
29.12 Comply with local, state, and federal regulations regarding landscape maintenance and pesticide applications.
29.13 Demonstrate sanitation and safety practices when maintaining landscape.

30.0 MAINTAIN CUSTOMER RELATIONS AND OBSERVE FOLLOW-UP PROCEDURES--The student will be able to:

30.01 Conduct walk-through of project with client to assure satisfaction.
30.02 Identify current and future maintenance requirements.
30.03 Analyze project records for profitability and employee performance.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106810
Course Title: Agriscience Foundations I
Course Credit: 1

COURSE DESCRIPTION:

This course was developed as a core and is designed to develop competencies in the areas of agricultural history; global importance of agriculture; career opportunities; applied scientific and technological concepts; ecosystems; agricultural safety; principles of integrated pest management; principles of plant and animal growth; economic principles; agricultural marketing; and human relations skills.

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.

02.12 Explain the flow of energy from the sun through agricultural systems.

02.13 Describe the environmental requirements necessary for a productive natural or man made aquaculture system.

02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.

03.02 Discuss the importance of following proper safety precautions in the agricultural industry.

03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.

03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.

04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).

04.03 Demonstrate the ability to use an equipment manual.

04.04 Demonstrate the use of selected tools, equipment, and instruments.

04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.

05.02 Identify and select an appropriate control for each type of pest and/or weed.

05.03 Describe symptoms of pesticide poisoning.

05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).

05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).

05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.

05.07 Identify the proper disposal of containers and residual pesticides.

05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.

09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121510
Course Title: Introductory Horticulture 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of career opportunities; global importance of agriculture; plant classification; propagation; growing media; nutritional needs; fertilization; irrigation; pest identification; pest control, pruning; plant installation; transplanting; safe hand-tool use; and employability skills.

10.0 DESCRIBE THE HORTICULTURE INDUSTRY--The student will be able to:

- 10.01 Describe the importance of horticulture to the American and global economies.
- 10.02 Identify career opportunities in horticulture and educational requirements and continuing education opportunities for horticulture careers.
- 10.03 Describe the importance of horticulture to the environment.

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

- 11.01 Identify plants by scientific and common names. Level I.
- 11.02 Classify plants botanically and list environmental preference of plants (e.g., shade, sun, wind, moisture, salt). Level I.

12.0 PROPAGATE PLANTS--The student will be able to:

- 12.01 Identify propagating and growing facilities and structures.
- 12.02 Prepare propagation media.
- 12.03 Select and collect propagation materials.
- 12.04 Demonstrate propagation by sexual and asexual methods.
- 12.05 Demonstrate environmental controls for propagation materials (e.g., moisture, temperature, light).

13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:

- 13.01 Identify soil and media materials.
- 13.02 Identify nutritional needs of plants.
- 13.03 Identify symptoms of nutritional deficiencies and toxicities of plants.
- 13.04 Identify types and kinds of fertilizers.
- 13.05 Identify methods of distributing fertilizers.

14.0 IRRIGATE PLANTS AND TURF--The student will be able to:

- 14.01 Identify water needs of plants.

14.02 Irrigate plants at recommended rates.

15.0 CONTROL PESTS--The student will be able to:

15.01 Identify common pests of plants (e.g., diseases, weeds, nematodes).
15.02 Describe life cycles of common pests of plants.

19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:

19.01 Conduct group meetings, using parliamentary procedure and public speaking skills.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121520
Course Title: Horticulture Science 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of industry regulations; plant classification; plant transportation; soil sampling and analysis; fertilizer calculations; recording keeping; irrigation components, water quality; drainage; integrated pest management; pesticide safety and regulations; equipment calibration; chemical growth regulators; xeriscaping; integrated landscape management; safe use of power equipment; record keeping; and employability skills.

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

- 11.01 Identify plants by scientific and common names.
- 11.02 Classify plants botanically and list environmental preference of plants (e.g., shade, sun, wind, moisture, salt).

13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:

- 13.06 Interpret analysis of fertilizer from information on tag or container.
- 13.07 Apply fertilizer and soil amendments.

15.0 CONTROL PESTS--The student will be able to:

- 15.03 Classify insects according to feeding habits.
- 15.04 Describe biological, chemical, and cultural methods of controlling plant pests.

16.0 CONTROL PLANT GROWTH--The student will be able to:

- 16.01 Identify methods of pruning plants to achieve desired growth and to maintain health.
- 16.02 Identify appropriate time to prune plants.
- 16.03 Identify and select pruning tools for the task.

17.0 HARVEST, TRANSPORT, AND INSTALL PLANT MATERIALS--The student will be able to:

- 17.01 Determine requirements for preserving plant viability.
- 17.02 Install containerized plant materials.
- 17.03 Select and prepare plants for transportation and transplanting.

18.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

18.01 Perform equipment preoperational check.

18.02 Identify, maintain, and safely operate hand tools and power tools.

19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:

19.02 Identify acceptable work habits and personal characteristics.

19.03 Identify acceptable employee hygiene habits.

19.04 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121310
Course Title: Landscape and Turf Science 4
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of use and maintenance of landscape and turf equipment; classification of plants and turfgrass; fertilization; and irrigation.

20.0 MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

20.01 Maintain oil level in engines of power equipment.
20.02 Check and maintain tire air pressure on equipment.
20.03 Maintain fuel levels using proper fuel or fuel mixtures.
20.04 Operate manual transmissions.
20.05 Identify, operate, and maintain tractor and power equipment.
20.06 Service and maintain battery and electrical systems.
20.07 Perform minor tune-up on engines.
20.08 Load, secure, and transport equipment.
20.09 Demonstrate safety precautions while working with tools and equipment.

22.0 CLASSIFY PLANTS AND TURFGRASS--The student will be able to:

22.01 Classify plants as monocots or dicots.
22.02 Classify plants and turfgrass as annuals, biennials, and perennials.
22.03 Identify plants and turfgrass that are specific to a region.
22.04 Classify plants and turfgrass according to growth habit.
22.05 Identify poisonous plants.

23.0 DEMONSTRATE FERTILIZATION SKILLS--The students will be able to:

23.01 Develop a fertilization schedule.
23.02 Determine rate of fertilizer application and calibration equipment.
23.03 Calibrate fertilizer equipment.

24.0 IRRIGATE PLANTS AND TURF--The student will be able to:

24.01 Identify various types of irrigation systems.
24.02 Install piping and water distribution components.
24.03 Install valves, timers, rain shut-offs, moisture sensors, and back flow prevention devices.
24.04 Check and evaluate irrigation system performance.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121320
Course Title: Landscape and Turf Science 5
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of chemical application; equipment calibration; analyzing and designing landscape and turf; preparing estimates and contracts; and lay out and installation of landscape, interiorscape and turf.

21.0 APPLY CHEMICAL AND CALIBRATE SPRAY EQUIPMENT--The student will be able to:

21.01 Select, mix, and apply a nonrestricted chemical, according to the label and local, state, federal, and EPA regulations.
21.02 Calibrate spray and spread equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.
21.03 Identify and report insect and disease damage.
21.04 Determine chemical compatibility.
21.05 Determine appropriate time frequency and method of chemical application.

25.0 ANALYZE AND DESIGN LANDSCAPE AND TURF--The student will be able to:

25.01 Analyze and interpret plans, specifications, and environmental conditions of the project.
25.02 Design the project.
25.03 Identify and locate project materials.
25.04 Determine personnel and equipment needs and safety requirements for the project.
25.05 Establish project schedule.

26.0 PREPARE ESTIMATES, CONTRACTS, AND PRESENTATION--The student will be able to:

26.01 Determine costs of materials, equipment, and labor.
26.02 Prepare a price for the project and terms of contract.
26.03 Prepare written contract, using standard rules of English including punctuation, spelling, sentence structure and references.
26.04 Prepare and give oral presentation of the project design, using standard rules of English including punctuation and sentence structure.
26.05 Maintain job records, daily log sheets, and inventory.

27.0 LAY OUT AND INSTALL LANDSCAPE, INTERIORSCAPE, AND TURF--The student will be able to:

27.01 Locate existing utilities and secure a permit.
27.02 Prepare and rough grade the site.
27.03 Determine procedures for installation of large materials.
27.04 Install and test irrigation system.
27.05 Describe procedures for constructing hardscape (walls, walks, patios, drives, etc.).

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121330
Course Title: Landscape Operations 6
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of chemical application; equipment calibration; analyzing and designing landscape and turf; preparing estimates and contracts; and lay out and installation of landscape, interiorscape and turf.

28.0 LAY OUT AND INSTALL LANDSCAPE AND INTERIORSCAPE--The student will be able to:

28.01 Layout and install plants.
28.02 Prepare landscape and interiorscape.
28.03 Prepare final grade.
28.04 Layout and install plants and turf.
28.05 Install mulch and perform final cleanup.

29.0 MAINTAIN LANDSCAPE--The student will be able to:

29.01 Perform maintenance inspection of the project.
29.02 Determine water requirements and apply at proper rates.
29.03 Identify weeds and apply herbicides safely.
29.04 Determine fertilization requirements and apply at proper rates.
29.05 Identify plant pest and disease problems and apply corrective measures.
29.06 Trim and prune landscape plants.
29.07 Maintain turf viability; mow at proper height and frequency, blade edge, line trim, and remove trash.
29.08 Explain cause and effect of soil compaction and thatch buildups, and determine appropriate methods of correction.
29.09 Cultivate and mulch plants.
29.10 Brace and repair trees.
29.11 Provide protection for plants from adverse weather conditions.
29.12 Comply with local, state, and federal regulations regarding landscape maintenance and pesticide applications.
29.13 Demonstrate sanitation and safety practices when maintaining landscape.

30.0 MAINTAIN CUSTOMER RELATIONS AND OBSERVE FOLLOW-UP PROCEDURES--The student will be able to:

30.01 Conduct walk-through of project with client to assure satisfaction.
30.02 Identify current and future maintenance requirements.
30.03 Analyze project records for profitability and employee performance.

July 1997

Florida Department of Education
INTENDED OUTCOMES

Program Title: Nursery Operations

	SECONDARY	PSAV
Program Number	**8121600**	**A010616**
CIP Number	0101.060610	0101.060610
Grade Level	9-12, 30, 31	30, 31
Length	6 credits	900 hours
Certification	VOC AGRI @4 AGRICULTUR 1 @2 AGRI @4 HORTICULT #7	VOC AGRI @4 AGRICULTUR 1 @2 AGRI @2 @4 HORTICULT @7 G
Basic Skills		
Math		8
Language		8
Reading		8

INTENDED OUTCOMES: After successfully completing appropriate outcomes for each occupational completion point of this program the student will be able to perform the following:

OCCUPATIONAL COMPLETION POINT - DATA CODE A
HORTICULTURE WORKER (AGRI) I - DOT Code 405.684-014 (CORE)

01.0 Describe the socioeconomic role of the agricultural industry.
02.0 Apply scientific and technological principles to the agricultural industry.
03.0 Practice agricultural safety.
04.0 Demonstrate the use of tools, equipment and instruments in the agricultural industry.
05.0 Describe the principles of integrated pest management (IPM).
06.0 Describe the principles of plant and/or animal growth and reproduction.
07.0 Apply business skills and economic principles to the agricultural industry.
08.0 Explain the basic marketing processes in the agricultural industry.
09.0 Demonstrate human relations, communications, and leadership skills.
10.0 Describe the horticulture industry.
11.0 Identify and classify plants.
12.0 Propagate plants.
13.0 Identify growing media and apply fertilizers.
14.0 Irrigate plants and turf.
15.0 Control pests.
16.0 Control plant growth.
17.0 Harvest, transport, and install plant materials.
18.0 Operate, repair, and maintain tools and equipment.
19.0 Demonstrate leadership, employability, communications, and human relations skills.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
NURSERY WORKER - OES Code 79005511

20.0 Identify and classify plants.
21.0 Control pests.
22.0 Operate, repair, and maintain tools and equipment.
23.0 Prepare growing media.
24.0 Irrigate plants.
25.0 Fertilize plant materials.
26.0 Maintain and analyze records.

OCCUPATIONAL COMPLETION POINT - DATA CODE C
HORTICULTURAL-SPECIALTY GROWER, FIELD - DOT Code 405.161-014

27.0 Irrigate plants and turf.
28.0 Prepare growing media, planting beds, and sites.
29.0 Propagate nursery stock.
30.0 Prune and shape nursery stock.
31.0 Harvest, process, and ship nursery stock.
32.0 Market nursery stock.
33.0 Operate, repair, and maintain nursery equipment and facilities.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title:	Nursery Operations
Secondary Number:	8121600
Postsecondary Number:	A010616

OCCUPATIONAL COMPLETION POINT - DATA CODE A
HORTICULTURAL WORKER (AGRI) I - DOT Code 405.684-014

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.
02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.

06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.
09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

10.0 DESCRIBE THE HORTICULTURE INDUSTRY--The student will be able to:

10.01 Describe the importance of horticulture to the American and global economies.

10.02 Identify career opportunities in horticulture and educational requirements and continuing education opportunities for horticulture careers.
10.03 Describe the importance of horticulture to the environment.

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

11.01 Identify plants by scientific and common names.
11.02 Classify plants botanically and list environmental preference of plants (e.g., shade, sun, wind, moisture, salt).

12.0 PROPAGATE PLANTS--The student will be able to:

12.01 Identify propagating and growing facilities and structures.
12.02 Prepare propagation media.
12.03 Select and collect propagation materials.
12.04 Demonstrate propagation by sexual and asexual methods.
12.05 Demonstrate environmental controls for propagation materials (e.g., moisture, temperature, light).

13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:

13.01 Identify soil and media materials.
13.02 Identify nutritional needs of plants.
13.03 Identify symptoms of nutritional deficiencies and toxicities of plants.
13.04 Identify types and kinds of fertilizers.
13.05 Identify methods of distributing fertilizers.
13.06 Interpret analysis of fertilizer from information on tag or container.
13.07 Apply fertilizer and soil amendments.

14.0 IRRIGATE PLANTS AND TURF--The student will be able to:

14.01 Identify water needs of plants.
14.02 Irrigate plants at recommended rates.

15.0 CONTROL PESTS--The student will be able to:

15.01 Identify common pests of plants (e.g., diseases, weeds, nematodes).
15.02 Describe life cycles of common pests of plants.
15.03 Classify insects according to feeding habits.
15.04 Describe biological, chemical, and cultural methods of controlling plant pests.

16.0 CONTROL PLANT GROWTH--The student will be able to:

16.01 Identify methods of pruning plants to achieve desired growth and to maintain health.
16.02 Identify appropriate time to prune plants.
16.03 Identify and select pruning tools for the task.

17.0 HARVEST, TRANSPORT, AND INSTALL PLANT MATERIALS--The student will be able to:

- 17.01 Determine requirements for preserving plant viability.
- 17.02 Install containerized plant materials.
- 17.03 Select and prepare plants for transportation and transplanting.

18.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

- 18.01 Perform equipment preoperational check.
- 18.02 Identify, maintain, and safely operate hand tools and power tools.

19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:

- 19.01 Conduct group meetings, using parliamentary procedure and public speaking skills.
- 19.02 Identify acceptable work habits and personal characteristics.
- 19.03 Identify acceptable employee hygiene habits.
- 19.04 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
NURSERY WORKER - OES Code 79005505

20.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

- 20.01 Classify plants as monocots or dicots.
- 20.02 Classify plants as annuals, biennials, and perennials.
- 20.03 Identify plants appropriate to a region.
- 20.04 Classify plants according to growth habit.
- 20.05 Prepare propagation materials (seeds, cuttings, etc.) for planting.
- 20.06 Apply growth stimulants to propagation materials.
- 20.07 Demonstrate sanitation and safety practices when propagating.
- 20.08 Prepare flats and seedbeds and plant seeds.

21.0 CONTROL PESTS--The student will be able to:

- 21.01 Report insect and disease damage.
- 21.02 Identify chemical spray damage.
- 21.03 Select proper IPM practices (biological, chemical and physical) for control of insects, diseases, vertebrates and weeds.
- 21.04 Evaluate the efficacy and phytotoxicity of a chemical prior to inclusion in a growing program.

22.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

- 22.01 Identify, operate, and maintain tractor and power equipment.
- 22.02 Load, secure, and transport equipment.

23.0 PREPARE GROWING MEDIA--The student will be able to:

23.01 Sterilize rooting, potting, and growing media.
23.02 Adjust pH and nutritional levels of media.
23.03 Fill and level benches and pots with media.
23.04 Demonstrate sanitation practices when handling and storing plant media materials.

24.0 IRRIGATE PLANTS--The student will be able to:

24.01 Set up an irrigation system for a propagation area.
24.02 Set up an irrigation system for a growing structure.
24.03 Set up an irrigation system for a retail display.
24.04 Maintain and repair an irrigation system.
24.05 Identify and use various types of irrigation systems (low volume, ebb and flow, drip, mat, recirculating, etc.).

25.0 FERTILIZE PLANT MATERIALS--The student will be able to:

25.01 Collect soil and leaf tissue samples for analysis.
25.02 Interpret and evaluate the results of soil and leaf tissue analysis and determine corrective actions.
25.03 Demonstrate proper handling and storage of fertilizers, observing safety precautions.
25.04 Evaluate, operate, and maintain fertilizer distribution equipment.
25.05 Develop a fertilization schedule for various plant species.
25.06 Determine rate of fertilizer application.

26.0 MAINTAIN AND ANALYZE RECORDS--The student will be able to:

26.01 Analyze and maintain production and sales records.
26.02 Determine plant production costs.
26.03 Prepare a budget.
26.04 Prepare and maintain financial records using computer software.
26.05 Maintain current plant inventory.
26.06 Maintain job records, daily log sheets, and inventory.

OCCUPATIONAL COMPLETION POINT - DATA CODE C
HORTICULTURAL-SPECIALTY GROWER, FIELD - DOT Code 405.161-014

27.0 IRRIGATE PLANTS AND TURF--The student will be able to:

27.01 Identify drainage components for different types of drainage systems.
27.02 Install irrigation systems with control valves and clocks.
27.03 Set up an irrigation system for a growing area.

28.0 PREPARE GROWING MEDIA, PLANTING BEDS, AND SITES--The student will be able to:

28.01 Identify the difference between evergreen and deciduous plants.
28.01 Mix rooting and growing media according to plant requirements.
28.02 Collect and test a soil sample from field and potting media.

28.03 Prepare planting beds and sites.

29.0 PROPAGATE NURSERY STOCK--The student will be able to:

29.01 Demonstrate sanitation and safety practices when propagating.
29.02 Identify and utilize commonly used propagation and growing containers.
29.03 Prepare and plant seeds in flats and seedbeds.
29.04 Maintain proper records and labels when propagating plants.
29.05 Propagate plants by the asexual method.
29.06 Evaluate commercial media containers.

30.0 PRUNE AND SHAPE NURSERY STOCK--The student will be able to:

30.01 Prune plants to achieve desired growth and shape.
30.02 Select and use chemical growth regulators.
30.03 Identify techniques for pruning specialty items (topiary, bonsai).
30.04 Set up an irrigation system for a growing area.

31.0 HARVEST, PROCESS, AND SHIP NURSERY STOCK--The student will be able to:

31.01 Determine customer needs per landscape plan.
31.02 Grade and harvest field-grown plants (ball, burlap, bare-root, "grow bags").
31.03 Identify mechanical techniques for harvesting field-grown plants (tree spade and mechanical digger).
31.04 Select and assemble container-grown plants using industry accepted grades and standards.
31.05 Prepare for shipment, loading, and transporting harvested plant materials.
31.06 Comply with regulations regarding the inspection and movement of plant materials.
31.07 Demonstrate safety practices when harvesting, processing, and shipping nursery stock.
31.08 Determine proper shipping environment.

32.0 MARKET NURSERY STOCK--The student will be able to:

32.01 Label and merchandise plants including plant care tags, bar codes, and shipping instructions.
32.02 Maintain clean and attractive merchandising and display areas safely.
32.03 Use various advertising methods to promote sales.
32.04 Take telephone orders.
32.05 Use sales catalog.
32.06 Greet customers and close sales.
32.07 Describe care and use of plants and related products to customers.
32.08 Handle customer complaints and problems.

33.0 OPERATE, REPAIR, AND MAINTAIN NURSERY EQUIPMENT AND FACILITIES--The student will be able to:

33.01 Determine equipment needs for the job.
33.02 Order parts and supplies.
33.03 Perform simple electrical repairs.
33.04 Build or repair frames, benches, and other greenhouse or nursery facilities.
33.05 Demonstrate safety practices when working with equipment and facilities.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106810
Course Title: Agriscience Foundations I
Course Credit: 1

COURSE DESCRIPTION:

This course was developed as a core and is designed to develop competencies in the areas of agricultural history; global importance of agriculture; career opportunities; applied scientific and technological concepts; ecosystems; agricultural safety; principles of integrated pest management; principles of plant and animal growth; economic principles; agricultural marketing; and human relations skills.

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.

02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.

09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121510
Course Title: Introductory Horticulture 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of career opportunities; global importance of agriculture; plant classification; propagation; growing media; nutritional needs; fertilization; irrigation; pest identification; pest control, pruning; plant installation; transplanting; safe hand-tool use; and employability skills.

10.0 DESCRIBE THE HORTICULTURE INDUSTRY--The student will be able to:

- 10.01 Describe the importance of horticulture to the American and global economies.
- 10.02 Identify career opportunities in horticulture and educational requirements and continuing education opportunities for horticulture careers.
- 10.03 Describe the importance of horticulture to the environment.

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

- 11.01 Identify plants by scientific and common names. Level I.
- 11.02 Classify plants botanically and list environmental preference of plants (e.g., shade, sun, wind, moisture, salt). Level I.

12.0 PROPAGATE PLANTS--The student will be able to:

- 12.01 Identify propagating and growing facilities and structures.
- 12.02 Prepare propagation media.
- 12.03 Select and collect propagation materials.
- 12.04 Demonstrate propagation by sexual and asexual methods.
- 12.05 Demonstrate environmental controls for propagation materials (e.g., moisture, temperature, light).

13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:

- 13.01 Identify soil and media materials.
- 13.02 Identify nutritional needs of plants.
- 13.03 Identify symptoms of nutritional deficiencies and toxicities of plants.
- 13.04 Identify types and kinds of fertilizers.
- 13.05 Identify methods of distributing fertilizers.

14.0 IRRIGATE PLANTS AND TURF--The student will be able to:

- 14.01 Identify water needs of plants.

14.02 Irrigate plants at recommended rates.

15.0 CONTROL PESTS--The student will be able to:

15.01 Identify common pests of plants (e.g., diseases, weeds, nematodes).
15.02 Describe life cycles of common pests of plants.

19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:

19.01 Conduct group meetings, using parliamentary procedure and public speaking skills.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121520
Course Title: Horticulture Science 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of industry regulations; plant classification; plant transportation; soil sampling and analysis; fertilizer calculations; recording keeping; irrigation components, water quality; drainage; integrated pest management; pesticide safety and regulations; equipment calibration; chemical growth regulators; xeriscaping; integrated landscape management; safe use of power equipment; record keeping; and employability skills.

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

- 11.01 Identify plants by scientific and common names.
- 11.02 Classify plants botanically and list environmental preference of plants (e.g., shade, sun, wind, moisture, salt).

13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:

- 13.06 Interpret analysis of fertilizer from information on tag or container.
- 13.07 Apply fertilizer and soil amendments.

15.0 CONTROL PESTS--The student will be able to:

- 15.03 Classify insects according to feeding habits.
- 15.04 Describe biological, chemical, and cultural methods of controlling plant pests.

16.0 CONTROL PLANT GROWTH--The student will be able to:

- 16.01 Identify methods of pruning plants to achieve desired growth and to maintain health.
- 16.02 Identify appropriate time to prune plants.
- 16.03 Identify and select pruning tools for the task.

17.0 HARVEST, TRANSPORT, AND INSTALL PLANT MATERIALS--The student will be able to:

- 17.01 Determine requirements for preserving plant viability.
- 17.02 Install containerized plant materials.
- 17.03 Select and prepare plants for transportation and transplanting.

18.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

18.01 Perform equipment preoperational check.
18.02 Identify, maintain, and safely operate hand tools and power tools.

19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:

19.02 Identify acceptable work habits and personal characteristics.
19.03 Identify acceptable employee hygiene habits.
19.04 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.

Program: 8121600 Nursery Operations

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121610
Course Title: Horticulture Science and Services 4
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of plant identification and classification; growing media; irrigation system set up; and maintaining and analyzing records including production costs.

20.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

20.01 Classify plants as monocots or dicots.
20.02 Classify plants as annuals, biennials, and perennials.
20.03 Identify plants appropriate to a region.
20.04 Classify plants according to growth habit.
20.05 Prepare propagation materials (seeds, cuttings, etc.) for planting.
20.06 Apply growth stimulants to propagation materials.
20.07 Demonstrate sanitation and safety practices when propagating.
20.08 Prepare flats and seedbeds and plant seeds.

22.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

22.01 Identify, operate, and maintain tractor and power equipment.
22.02 Load, secure, and transport equipment.

23.0 PREPARE GROWING MEDIA--The student will be able to:

23.01 Sterilize rooting, potting, and growing media.
23.02 Adjust pH and nutritional levels of media.
23.03 Fill and level benches and pots with media.
23.04 Demonstrate sanitation practices when handling and storing plant media materials.

24.0 IRRIGATE PLANTS--The student will be able to:

24.01 Set up an irrigation system for a propagation area.
24.02 Set up an irrigation system for a growing structure.
24.03 Set up an irrigation system for a retail display.

26.0 MAINTAIN AND ANALYZE RECORDS--The student will be able to:

26.01 Analyze and maintain production and sales records.
26.02 Determine plant production costs.
26.03 Prepare a budget.
26.04 Prepare and maintain financial records using computer software.
26.05 Maintain current plant inventory.

26.06 Maintain job records, daily log sheets, and inventory.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121620
Course Title: Horticulture Science and Services 5
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of identifying and evaluating IPM practices; maintaining and repairing irrigation systems; analyzing and evaluating fertilizer usage.

21.0 CONTROL PESTS--The student will be able to:

21.01 Report insect and disease damage.
21.02 Identify chemical spray damage.
21.03 Select proper IPM practices (biological, chemical and physical) for control of insects, diseases, vertebrates and weeds.
21.04 Evaluate the efficacy and phytotoxicity of a chemical prior to inclusion in a growing program.

24.0 IRRIGATE PLANTS--The student will be able to:

24.04 Maintain and repair an irrigation system.
24.05 Identify and use various types of irrigation systems (low volume, ebb and flow, drip, mat, recirculating, etc.).

25.0 FERTILIZE PLANT MATERIALS--The student will be able to:

25.01 Collect soil and leaf tissue samples for analysis.
25.02 Interpret and evaluate the results of soil and leaf tissue analysis and determine corrective actions.
25.03 Demonstrate proper handling and storage of fertilizers, observing safety precautions.
25.04 Evaluate, operate, and maintain fertilizer distribution equipment.
25.05 Develop a fertilization schedule for various plant species.
25.06 Determine rate of fertilizer application.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121630
Course Title: Nursery Operations 6
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of irrigation; growing media; planting beds and sites; propagation; marketing; repair and maintenance of nursery equipment and facilities.

27.0 IRRIGATE PLANTS AND TURF--The student will be able to:

27.01 Identify drainage components for different types of drainage systems.
27.02 Install irrigation systems with control valves and clocks.
27.03 Set up an irrigation system for a growing area.

28.0 PREPARE GROWING MEDIA, PLANTING BEDS, AND SITES--The student will be able to:

28.01 Identify the difference between evergreen and deciduous plants.
28.01 Mix rooting and growing media according to plant requirements.
28.02 Collect and test a soil sample from field and potting media.
28.03 Prepare planting beds and sites.

29.0 PROPAGATE NURSERY STOCK--The student will be able to:

29.01 Demonstrate sanitation and safety practices when propagating.
29.02 Identify and utilize commonly used propagation and growing containers.
29.03 Prepare and plant seeds in flats and seedbeds.
29.04 Maintain proper records and labels when propagating plants.
29.05 Propagate plants by the asexual method.
29.06 Evaluate commercial media containers.

30.0 PRUNE AND SHAPE NURSERY STOCK--The student will be able to:

30.01 Prune plants to achieve desired growth and shape.
30.02 Select and use chemical growth regulators.
30.03 Identify techniques for pruning specialty items (topiary, bonsai).
30.04 Set up an irrigation system for a growing area.

31.0 HARVEST, PROCESS, AND SHIP NURSERY STOCK--The student will be able to:

31.01 Determine customer needs per landscape plan.
31.02 Grade and harvest field-grown plants (ball, burlap, bare-root, "grow bags").

31.03 Identify mechanical techniques for harvesting field-grown plants (tree spade and mechanical digger).
31.04 Select and assemble container-grown plants using industry accepted grades and standards.
31.05 Prepare for shipment, loading, and transporting harvested plant materials.
31.06 Comply with regulations regarding the inspection and movement of plant materials.
31.07 Demonstrate safety practices when harvesting, processing, and shipping nursery stock.
31.08 Determine proper shipping environment.

32.0 MARKET NURSERY STOCK--The student will be able to:

32.01 Label and merchandise plants including plant care tags, bar codes, and shipping instructions.
32.02 Maintain clean and attractive merchandising and display areas safely.
32.03 Use various advertising methods to promote sales.
32.04 Take telephone orders.
32.05 Use sales catalog.
32.06 Greet customers and close sales.
32.07 Describe care and use of plants and related products to customers.
32.08 Handle customer complaints and problems.

33.0 OPERATE, REPAIR, AND MAINTAIN NURSERY EQUIPMENT AND FACILITIES--The student will be able to:

33.01 Determine equipment needs for the job.
33.02 Order parts and supplies.
33.03 Perform simple electrical repairs.
33.04 Build or repair frames, benches, and other greenhouse or nursery facilities.
33.05 Demonstrate safety practices when working with equipment and facilities.

July 1997

Florida Department of Education
INTENDED OUTCOMES

Program Title: Sports And Recreational Turf Operations

	SECONDARY	PSAV
Program Number	**8121400**	**A020607**
CIP Number	0101.060700	0101.060700
Grade Level	9-12, 30, 31	30, 31
Length	6 credits	900 hours
Certification	VOC AGRI @4	VOC AGRI @4
	AGRICULTUR 1 @2	AGRICULTUR 1 @2
	AGRI @4	AGRI @2 @4
	HORTICULT #7	HORTICULT @7 G
Basic Skills		
Math		8
Language		8
Reading		8

INTENDED OUTCOMES: After successfully completing appropriate outcomes for each occupational completion point of this program the student will be able to perform the following:

OCCUPATIONAL COMPLETION POINT - DATA CODE A
LANDSCAPE SPECIALISTS - DOT Code 406.687-010

01.0 Describe the socioeconomic role of the agricultural industry.
02.0 Apply scientific and technological principles to the agricultural industry.
03.0 Practice agricultural safety.
04.0 Demonstrate the use of tools, equipment and instruments in the agricultural industry.
05.0 Describe the principles of integrated pest management (IPM).
06.0 Describe the principles of plant and/or animal growth and reproduction.
07.0 Apply business skills and economic principles to the agricultural industry.
08.0 Explain the basic marketing processes in the agricultural industry.
09.0 Demonstrate human relations, communications, and leadership skills.
10.0 Describe the horticulture industry.
11.0 Identify and classify plants.
12.0 Propagate plants.
13.0 Identify growing media and apply fertilizers.
14.0 Irrigate plants and turf.
15.0 Control pests.
16.0 Control plant growth.
17.0 Harvest, transport, and install plant materials.
18.0 Operate, repair, and maintain tools and equipment.
19.0 Demonstrate leadership, employability, communications, and human relations skills.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
GARDENERS AND GROUNDSKEEPERS - OES Code 79030000

20.0 Maintain tools and equipment.
21.0 Apply chemical and calibrate spray equipment.
22.0 Classify plants and turfgrass.
23.0 Demonstrate fertilization skills.
24.0 Irrigate plants and turf.
25.0 Analyze and design landscape and turf.
26.0 Prepare estimates, contracts, and presentation.
27.0 Lay out and install landscape and turf.

OCCUPATIONAL COMPLETION POINT - DATA CODE C
GREENSKEEPER I - DOT Code 406.137-010

28.0 Maintain greens and tees.
29.0 Maintain fairways, roughs, and traps.
30.0 Fertilize turf.
31.0 Establish turfgrass.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title:	Sports And Recreational Turf Operations
Secondary Number:	8121400
Postsecondary Number:	A020607

OCCUPATIONAL COMPLETION POINT - DATA CODE A

GROUNDSKEEPER, PARKS AND GROUNDS - DOT Code 407.687-010

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.
02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.

06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.
09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

10.0 DESCRIBE THE HORTICULTURE INDUSTRY--The student will be able to:

10.01 Describe the importance of horticulture to the American and global economies.

10.02 Identify career opportunities in horticulture and educational requirements and continuing education opportunities for horticulture careers.
10.03 Describe the importance of horticulture to the environment.

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

11.01 Identify plants by scientific and common names.
11.02 Classify plants botanically and list environmental preference of plants (e.g., shade, sun, wind, moisture, salt).

12.0 PROPAGATE PLANTS--The student will be able to:

12.01 Identify propagating and growing facilities and structures.
12.02 Prepare propagation media.
12.03 Select and collect propagation materials.
12.04 Demonstrate propagation by sexual and asexual methods.
12.05 Demonstrate environmental controls for propagation materials (e.g., moisture, temperature, light).

13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:

13.01 Identify soil and media materials.
13.02 Identify nutritional needs of plants.
13.03 Identify symptoms of nutritional deficiencies and toxicities of plants.
13.04 Identify types and kinds of fertilizers.
13.05 Identify methods of distributing fertilizers.
13.06 Interpret analysis of fertilizer from information on tag or container.
13.07 Apply fertilizer and soil amendments.

14.0 IRRIGATE PLANTS AND TURF--The student will be able to:

14.01 Identify water needs of plants.
14.02 Irrigate plants at recommended rates.

15.0 CONTROL PESTS--The student will be able to:

15.01 Identify common pests of plants (e.g., diseases, weeds, nematodes).
15.02 Describe life cycles of common pests of plants.
15.03 Classify insects according to feeding habits.
15.04 Describe biological, chemical, and cultural methods of controlling plant pests.

16.0 CONTROL PLANT GROWTH--The student will be able to:

16.01 Identify methods of pruning plants to achieve desired growth and to maintain health.
16.02 Identify appropriate time to prune plants.
16.03 Identify and select pruning tools for the task.

17.0 HARVEST, TRANSPORT, AND INSTALL PLANT MATERIALS--The student will be able to:

17.01 Determine requirements for preserving plant viability.
17.02 Install containerized plant materials.
17.03 Select and prepare plants for transportation and transplanting.

18.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

18.01 Perform equipment preoperational check.
18.02 Identify, maintain, and safely operate hand tools and power tools.

19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:

19.01 Conduct group meetings, using parliamentary procedure and public speaking skills.
19.02 Identify acceptable work habits and personal characteristics.
19.03 Identify acceptable employee hygiene habits.
19.04 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
GARDENERS AND GROUNDSKEEPERS - OES Code 79014524

20.0 MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

20.01 Maintain oil level in engines of power equipment.
20.02 Check and maintain tire air pressure on equipment.
20.03 Maintain fuel levels using proper fuel or fuel mixtures.
20.04 Operate manual transmissions.
20.05 Identify, operate, and maintain tractor and power equipment.
20.06 Service and maintain battery and electrical systems.
20.07 Perform minor tune-up on engines.
20.08 Load, secure, and transport equipment.
20.09 Demonstrate safety precautions while working with tools and equipment.

21.0 APPLY CHEMICAL AND CALIBRATE SPRAY EQUIPMENT--The student will be able to:

21.01 Select, mix, and apply a nonrestricted chemical, according to the label and local, state, federal, and EPA regulations.
21.02 Calibrate spray and spread equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.
21.03 Identify and report insect and disease damage.
21.04 Determine chemical compatibility.
21.05 Determine appropriate time frequency and method of chemical application.

22.0 CLASSIFY PLANTS AND TURFGRASS--The student will be able to:

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22.01 Classify plants as monocots or dicots.
22.02 Classify plants and turfgrass as annuals, biennials, and perennials.
22.03 Identify plants and turfgrass that are specific to a region.
22.04 Classify plants and turfgrass according to growth habit.
22.05 Identify poisonous plants.

23.0 DEMONSTRATE FERTILIZATION SKILLS--The students will be able to:

23.01 Develop a fertilization schedule.
23.02 Determine rate of fertilizer application and calibration equipment.
23.03 Calibrate fertilizer equipment.

24.0 IRRIGATE PLANTS AND TURF--The student will be able to:

24.01 Identify various types of irrigation systems.
24.02 Install piping and water distribution components.
24.03 Install valves, timers, rain shut-offs, moisture sensors, and back flow prevention devices.
24.04 Check and evaluate irrigation system performance.

25.0 ANALYZE AND DESIGN LANDSCAPE AND TURF--The student will be able to:

25.01 Analyze and interpret plans, specifications, and environmental conditions of the project.
25.02 Design the project.
25.03 Identify and locate project materials.
25.04 Determine personnel and equipment needs and safety requirements for the project.
25.05 Establish project schedule.

26.0 PREPARE ESTIMATES, CONTRACTS, AND PRESENTATION--The student will be able to:

26.01 Determine costs of materials, equipment, and labor.
26.02 Prepare a price for the project and terms of contract.
26.03 Prepare written contract, using standard rule of English including punctuation, spelling, sentence structure and references.
26.04 Prepare and give oral presentation of the project design, using standard rules of English including punctuation and sentence structure.
26.05 Maintain job records, daily log sheets, and inventory.

27.0 LAYOUT AND INSTALL LANDSCAPE, INTERIORSCAPE, AND TURF--The student will be able to:

27.01 Locate existing utilities and secure a permit.
27.02 Prepare and rough grade the site.
27.03 Determine procedures for installation large materials.
27.04 Install and test irrigation system.

27.05 Describe procedures for constructing hardscape (walls, walks, patios, drives, etc.).

OCCUPATIONAL COMPLETION POINT - DATA CODE C
GREENSKEEPER - DOT Code 406.137-014

28.0 MAINTAIN GREENS AND TEES--The student will be able to:

28.01 Mow greens.
28.02 Mow collars.
28.03 Mow aprons.
28.04 Relocate cups.
28.05 Replace and relocate markers.
28.06 Irrigate greens.
28.07 Verticut turf.
28.08 Aerate turf.
28.09 Repair ball marks on greens.

29 0 MAINTAIN FAIRWAYS, ROUGHS, AND TRAPS--The student will be able to:

29.01 Mow roughs.
29.02 Irrigate fairways.
29.03 Repair divots.
29.04 Add sand to traps.
29.05 Rake and trim sand traps.
29.06 Mow fairways.
29.07 Edge sand traps.
29.08 Operate blower, sweeper, verticutter, and aerifier.

30.0 FERTILIZE TURF--The student will be able to:

30.01 Apply top dressing.
30.02 Apply grass seed.
30.03 Apply fertilizer to fairways.

31.0 ESTABLISH TURFGRASS--The student will be able to:

31.01 Level seedbed.
31.02 Plant grass seed.
31.03 Establish sod by plugging.
31.04 Establish sod by sodding.
31.05 Cut sod.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106810
Course Title: Agriscience Foundations I
Course Credit: 1

COURSE DESCRIPTION:

This course was developed as a core and is designed to develop competencies in the areas of agricultural history; global importance of agriculture; career opportunities; applied scientific and technological concepts; ecosystems; agricultural safety; principles of integrated pest management; principles of plant and animal growth; economic principles; agricultural marketing; and human relations skills.

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.

02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.

09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121510
Course Title: Introductory Horticulture 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of career opportunities; global importance of agriculture; plant classification; propagation; growing media; nutritional needs; fertilization; irrigation; pest identification; pest control, pruning; plant installation; transplanting; safe hand-tool use; and employability skills.

10.0 DESCRIBE THE HORTICULTURE INDUSTRY--The student will be able to:

- 10.01 Describe the importance of horticulture to the American and global economies.
- 10.02 Identify career opportunities in horticulture and educational requirements and continuing education opportunities for horticulture careers.
- 10.03 Describe the importance of horticulture to the environment

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

- 11.01 Identify plants by scientific and common names. Level I.
- 11.02 Classify plants botanically and list environmental preference of plants (e.g., shade, sun, wind, moisture, salt). Level I.

12.0 PROPAGATE PLANTS--The student will be able to:

- 12.01 Identify propagating and growing facilities and structures.
- 12.02 Prepare propagation media.
- 12.03 Select and collect propagation materials.
- 12.04 Demonstrate propagation by sexual and asexual methods.
- 12.05 Demonstrate environmental controls for propagation materials (e.g., moisture, temperature, light).

13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:

- 13.01 Identify soil and media materials.
- 13.02 Identify nutritional needs of plants.
- 13.03 Identify symptoms of nutritional deficiencies and toxicities of plants.
- 13.04 Identify types and kinds of fertilizers.
- 13.05 Identify methods of distributing fertilizers.

14.0 IRRIGATE PLANTS AND TURF--The student will be able to:

- 14.01 Identify water needs of plants.

14.02 Irrigate plants at recommended rates.

15.0 CONTROL PESTS--The student will be able to:

15.01 Identify common pests of plants (e.g., diseases, weeds, nematodes).
15.02 Describe life cycles of common pests of plants.

19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:

19.01 Conduct group meetings, using parliamentary procedure and public speaking skills.

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Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121520
Course Title: Horticulture Science 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of industry regulations; plant classification; plant transportation; soil sampling and analysis; fertilizer calculations; recording keeping; irrigation components, water quality; drainage; integrated pest management; pesticide safety and regulations; equipment calibration; chemical growth regulators; xeriscaping; integrated landscape management; safe use of power equipment; record keeping; and employability skills.

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

11.01 Identify plants by scientific and common names.
11.02 Classify plants botanically and list environmental preference of plants (e.g., shade, sun, wind, moisture, salt).

13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:

13.06 Interpret analysis of fertilizer from information on tag or container.
13.07 Apply fertilizer and soil amendments.

15.0 CONTROL PESTS--The student will be able to:

15.03 Classify insects according to feeding habits.
15.04 Describe biological, chemical, and cultural methods of controlling plant pests.

16.0 CONTROL PLANT GROWTH--The student will be able to:

16.01 Identify methods of pruning plants to achieve desired growth and to maintain health.
16.02 Identify appropriate time to prune plants.
16.03 Identify and select pruning tools for the task.

17.0 HARVEST, TRANSPORT, AND INSTALL PLANT MATERIALS--The student will be able to:

17.01 Determine requirements for preserving plant viability.
17.02 Install containerized plant materials.
17.03 Select and prepare plants for transportation and transplanting.

18.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

18.01 Perform equipment preoperational check.

18.02 Identify, maintain, and safely operate hand tools and power tools.

19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:

19.02 Identify acceptable work habits and personal characteristics.

19.03 Identify acceptable employee hygiene habits.

19.04 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121310
Course Title: Landscape and Turf Science 4
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of use and maintenance of landscape and turf equipment; classification of plants and turfgrass; fertilization; and irrigation.

20.0 MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

20.01 Maintain oil level in engines of power equipment.
20.02 Check and maintain tire air pressure on equipment.
20.03 Maintain fuel levels using proper fuel or fuel mixtures.
20.04 Operate manual transmissions.
20.05 Identify, operate, and maintain tractor and power equipment.
20.06 Service and maintain battery and electrical systems.
20.07 Perform minor tune-up on engines.
20.08 Load, secure, and transport equipment.
20.09 Demonstrate safety precautions while working with tools and equipment.

22.0 CLASSIFY PLANTS AND TURFGRASS--The student will be able to:

22.01 Classify plants as monocots or dicots.
22.02 Classify plants and turfgrass as annuals, biennials, and perennials.
22.03 Identify plants and turfgrass that are specific to a region.
22.04 Classify plants and turfgrass according to growth habit.
22.05 Identify poisonous plants.

23.0 DEMONSTRATE FERTILIZATION SKILLS--The students will be able to:

23.01 Develop a fertilization schedule.
23.02 Determine rate of fertilizer application and calibration equipment.
23.03 Calibrate fertilizer equipment.

24.0 IRRIGATE PLANTS AND TURF--The student will be able to:

24.01 Identify various types of irrigation systems.
24.02 Install piping and water distribution components.
24.03 Install valves, timers, rain shut-offs, moisture sensors, and back flow prevention devices.
24.04 Check and evaluate irrigation system performance.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121320
Course Title: Landscape and Turf Science 5
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of chemical application; equipment calibration; analyzing and designing landscape and turf; preparing estimates and contracts; and lay out and installation of landscape, interiorscape and turf.

21.0 APPLY CHEMICAL AND CALIBRATE SPRAY EQUIPMENT--The student will be able to:

21.01 Select, mix, and apply a nonrestricted chemical, according to the label and local, state, federal, and EPA regulations.
21.02 Calibrate spray and spread equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.
21.03 Identify and report insect and disease damage.
21.04 Determine chemical compatibility.
21.05 Determine appropriate time frequency and method of chemical application.

25.0 ANALYZE AND DESIGN LANDSCAPE AND TURF--The student will be able to:

25.01 Analyze and interpret plans, specifications, and environmental conditions of the project.
25.02 Design the project.
25.03 Identify and locate project materials.
25.04 Determine personnel and equipment needs and safety requirements for the project.
25.05 Establish project schedule.

26.0 PREPARE ESTIMATES, CONTRACTS, AND PRESENTATION--The student will be able to:

26.01 Determine costs of materials, equipment, and labor.
26.02 Prepare a price for the project and terms of contract.
26.03 Prepare written contract, using standard rules of English including punctuation, spelling, sentence structure and references.
26.04 Prepare and give oral presentation of the project design, using standard rules of English including punctuation and sentence structure.
26.05 Maintain job records, daily log sheets, and inventory.

27.0 LAY OUT AND INSTALL LANDSCAPE, INTERIORSCAPE, AND TURF--The student will be able to:

27.01 Locate existing utilities and secure a permit.
27.02 Prepare and rough grade the site.
27.03 Determine procedures for installation of large materials.
27.04 Install and test irrigation system.
27.05 Describe procedures for constructing hardscape (walls, walks, patios, drives, etc.).

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121410
Course Title: Sports and Recreational Turf Operations
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of maintenance of greens and tees; maintenance of fairways, roughs and traps; fertilization of turf and establishing turfgrass.

28.0 MAINTAIN GREENS AND TEES--The student will be able to:

28.01 Mow greens.
28.02 Mow collars.
28.03 Mow aprons.
28.04 Relocate cups.
28.05 Replace and relocate markers.
28.06 Irrigate greens.
28.07 Verticut turf.
28.08 Aerate turf.
28.09 Repair ball marks on greens.

29.0 MAINTAIN FAIRWAYS, ROUGHS, AND TRAPS--The student will be able to:

29.01 Mow roughs.
29.02 Irrigate fairways.
29.03 Repair divots.
29.04 Add sand to traps.
29.05 Rake and trim sand traps.
29.06 Mow fairways.
29.07 Edge sand traps.
29.08 Operate blower, sweeper, verticutter, and aerifier.

30.0 FERTILIZE TURF--The student will be able to:

30.01 Apply top dressing.
30.02 Apply grass seed.
30.03 Apply fertilizer to fairways.

31.0 ESTABLISH TURFGRASS--The student will be able to:

31.01 Level seedbed.
31.02 Plant grass seed.
31.03 Establish sod by plugging.
31.04 Establish sod by sodding.
31.05 Cut sod.

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Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Forest Management
Occupational Area:	Agriculture
	PSV
CIP Number	0103.050601
Grade Level	College Credits
Length	AS Degree
Certification	

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment as associate foresters, and associate natural resource planners, or to provide supplemental training for persons currently or primarily employed in these occupations. The content includes, but is not limited to instruction that prepares individuals to assist foresters and forest resource managers in the professional management, harvesting, regeneration and multiple-use concepts of the forest and forest lands. Instruction includes the study of forest measurements, forest management and planning, dendrology, forest economics, silviculture and reforestation, forest protection, forest law, forest soils, hydrology and water quality, forest ecology, aerial photo interpretation, forest surveying and mapping, forest equipment maintenance and operations, computerized forestry skills, forest safety and human relations, including communication skills.

II. **LABORATORY ACTIVITIES**: Forest laboratories, field trips and practical experiences are an integral part of this program. Activities include, but are not limited to areas such as the safe and proper use of: forest measurement instruments including portable data terminals; forest surveying instruments and systems including Geographic Information System (G.I.S.); forest fire/smoke and related equipment; forestry equipment used in harvesting, site-preparation, regeneration and road and bridge construction; and computer skills. Other laboratory activities include the identification of major commercial timber species, identification and controls for major forest insects and/or diseases.

III. **SPECIAL NOTE**: National Postsecondary Agricultural Student Organization is the appropriate vocational student organization for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

The program shall meet the standards as set forth by the Society of American Foresters (S.A.F.), the national organization that represents all segments of the forestry profession. (The Society of American Foresters "accredits" baccalaureate programs and "recognizes" associate programs.) The typical length of this program for the average achieving student is the associate degree. The standard credit hour length for this program is 75 hours.

Planned and supervised occupational activities may be provided through directed laboratory experience, practical or cooperative experience. Whenever the cooperative method of instruction is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks which are relevant to the occupation which the student has chosen as a career goal. The student may receive compensation for work performed.

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01.0 Prepare and administer forest management plans.
02.0 Plan and administer forest inventories.
03.0 Assist registered land surveyor in location of property corners and boundary lines, road and bridge construction and drainage projects.
04.0 Prepare and administer forest fire and smoke management plans and assist in forest fire suppression and control.
05.0 Identify major forest tree species.
06.0 Identify and control major forest insects and diseases.
07.0 Evaluate forest ecosystems.
08.0 Evaluate forest goals with respect to chemical and fertilizer applications and hydrology.
09.0 Collect, maintain and/or analyze data and records.
10.0 Prepare, analyze and enforce contracts and other legal documents
11.0 Supervise contractors and sub-contractors.
12.0 Supervise and train forest technicians and other employees.
13.0 Demonstrate communication and managerial skills.
14.0 Administer the purchase, sale and/or marketing of forest products.
15.0 Demonstrate effective human resource skills as a paraprofessional manager.
16.0 Prepare and effect work schedules.
17.0 Demonstrate decision-making skills.
18.0 Demonstrate skills in effective conflict resolution.

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Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Forest Management
Secondary Number:
Postsecondary Number: 0103.050601

01.0 PREPARE AND ADMINISTER FOREST MANAGEMENT PLANS--The student will be able to:

01.01 Prepare and conduct a statistically based forest inventory.
01.02 Calculate, analyze and evaluate forest inventory data.
01.03 Utilize Geographical Information Systems (G.I.S.) data to prepare tract maps and management recommendations.
01.04 Write an approximate management plan for tract based on landowner objectives including timber volumes, harvesting schedules, regeneration schedules, stand maps, stand and stock tables and recommendations for multiple-use and for future management.
01.05 Select and execute appropriate silvicultural system for tract.
01.06 Conduct a prescribed burn including pre-planning, permitting, firing systems, smoke management and suppression techniques.
01.07 Plan and execute timber stand improvement when needed.
01.08 Plan and execute appropriate site preparation, tree planting and harvesting.
01.09 Incorporate wildlife and recreational components into management plan as appropriate.
01.10 Demonstrate knowledge of ordinances related to harvesting and regeneration activities.

02.0 PLAN AND ADMINISTER FOREST INVENTORIES--The student will be able to:

02.01 Prepare and conduct a statistically based forest inventory using area samples, i.e. fixed-radius plot inventory.
02.02 Prepare and conduct a statistically based forest inventory using point sample, i.e. prism inventory.
02.03 Operate dendrometers such as tree calipers and diameter tape.
02.04 Operate hypsometers such as altimeter, clinometer and relaskop.
02.05 Operate hand-held magnetic compass and demonstrate proper pacing procedure in forested situations.
02.06 Locate forest tracts using legal description, maps, aerial photos and atlases.
02.07 Select and use appropriate volume tables.
02.08 Calculate timber volumes by forest products.
02.09 Calculate and prepare valuation of forest tract based on product and current market prices.
02.10 Prepare "lump sum" timber bid.
02.11 Prepare "per unit" timber bid.
02.12 Calculate and prepare stand and stock tables.
02.13 Calculate and prepare growth projections and regeneration stocking.
02.14 Calculate tract averages using maps, aerial photos and/or pacing.

03.0 ASSIST REGISTERED LAND SURVEYOR IN LOCATION OF PROPERTY CORNERS AND BOUNDARY LINES, ROAD AND BRIDGE CONSTRUCTION AND DRAINAGE PROJECTS--The student will be able to:

03.01 Set up and operate transit to determine horizontal and vertical angles.
03.02 Set up and operate level to determine forest topography and contours.
03.03 Determine proper horizontal distance using tape (chain) and/or electronic distance measuring (E.D.M.) device.
03.04 Identify (locate) forest tracts based on legal description and write proper legal description for given forest tract.
03.05 Conduct an on-the-ground survey and, using field notes, correct and close traverse, determine acreage and prepare map.
03.06 Locate and mark forest tract corners and boundary lines.
03.07 Determine forest road location and identify on the ground.
03.08 Determine drainage patterns for watershed and locate proper stream crossing points.
03.09 Determine proper stream crossing device, i.e. culvert, portable bridge, permanent bridge.
03.10 Obtain proper permits for stream crossings, i.e. culverts, bridges.
03.11 Prepare map of forest tract using G.I.S., when available.
03.12 Assist land surveyor with use of Global Positioning System (G.P.S.).

04.0 PREPARE AND ADMINISTER FOREST FIRE AND SMOKE MANAGEMENT PLANS AND ASSIST IN FOREST FIRE SUPPRESSION AND CONTROL--The student will be able to:

04.01 Demonstrate knowledge of various firing techniques.
04.02 Demonstrate knowledge of weather conditions as related to forest fire-prescribed and wildfire - and smoke management.
04.03 Select proper firing techniques based on landowner objectives and weather conditions.
04.04 Demonstrate knowledge of fire suppression tools and equipment, both handtools and mechanical.
04.05 Demonstrate knowledge of pre-suppression forest fire activities.
04.06 Evaluate acreage and damages of wildfire and recommend future forest management activities to renew resource.
04.07 Plan and administer a fire and smoke management plan including proper burning authorizations.
04.08 Complete U.S. Forest Service S-190, Introduction to Fire Behavior, and S-130, Basic Fire Fighter course with passing scores and, when possible, receive Incident Qualification Card ("Red Card").

05.0 IDENTIFY MAJOR FOREST TREE SPECIES--The student will be able to:

05.01 Identify major forest tree species of the United States by scientific name, common name and habitat.

05.02 Identify major commercial forest species of the Southeast United States by scientific name, common name, habitat and commercial products derived from species.
05.03 Identify major commercial forest species of Florida, with or without foliage, by personal observation using the five senses.
05.04 Use dichotomous key to identify unfamiliar species.

06.0 IDENTIFY AND CONTROL MAJOR FOREST INSECTS AND DISEASES--The student will be able to:

06.01 Identify major forest insects and diseases of the United States by scientific name, common name and damage inflicted.
06.02 Identify major forest insects and diseases of the Southeast United States by scientific name, common name, symptoms, damage inflicted and recommendations for control.
06.03 Identify major forest insects and diseases of Florida in the forest by personal observation and recommend appropriate controls.
06.04 Demonstrate knowledge of chemical and biological control of forest pests.
06.05 Where required, become properly licensed to handle and apply insecticides.
06.06 Evaluate damages by forest insects and diseases and make recommendations for future forest management.

07.0 EVALUATE FOREST ECOSYSTEMS--The student will be able to:

07.01 Demonstrate knowledge of the major forest ecosystems of the United States.
07.02 Identify the major forest ecosystems of Florida.
07.03 Identify the relationship between human activities and forest flora and fauna.
07.04 Demonstrate knowledge of carrying capacities and ecological niches.
07.05 Identify endangered species of Florida and associated regulations and/or recommended forest practices.
07.06 Demonstrate knowledge of threatened species of Florida and associated regulations and/or recommended forest practices.
07.07 Demonstrate knowledge of forest ecosystem practices on both private and public lands.

08.0 EVALUATE FOREST SOILS WITH RESPECT TO CHEMICAL AND FERTILIZER APPLICATIONS AND HYDROLOGY--The student will be able to:

08.01 Demonstrate knowledge of the major forest soil types in the Southeastern United States.
08.02 Identify and classify the major forest soil types of Florida.
08.03 Identify types, uses and application rates of approved forest herbicides.
08.04 Prepare and execute a herbicide plan.
08.05 Where required, become properly licensed to handle and apply forest herbicides.
08.06 Identify fertilizer formulations applicable to Florida forest soils.

08.07 Identify proper fertilizer formulations rates with proper soil type on Florida forest soils.
08.08 Define major watersheds and hydrology of a given forest area.
08.09 Demonstrate knowledge of Best Management Practices (B.M.P.s), especially streamside management zones (S.M.Z.s).
08.10 Identify and locate S.M.Z.'s on the ground.
08.11 Obtain proper permits relating to stream crossings, ditching, cut and fill and wetland harvesting.

09.0 COLLECT, MAINTAIN AND/OR ANALYZE DATA AND RECORDS--The student will be able to:

09.01 Collect field data from forest inventory and enter into personal computer.
09.02 Demonstrate knowledge of portable data terminals and personal computers.
09.03 Setup and supervise equipment maintenance and service schedules.
09.04 Setup and maintain files of technical forestry information.
09.05 Setup spreadsheet on personal computer and analyze data.
09.06 Setup and maintain personnel files.
09.07 Setup and maintain accounting systems for billings and/or payments on wood accounts.
09.08 Demonstrate knowledge of federal, state and local regulations related to forestry practices.
09.09 Determine owning and operating costs for equipment, depreciation schedules and interest capitalization.
09.10 Record and maintain accident reports and records.
09.11 Setup and maintain inventory system.

10.0 PREPARE, ANALYZE AND ENFORCE CONTRACTS AND OTHER LEGAL DOCUMENTS--The student will be able to:

10.01 Demonstrate knowledge of types of contracts and legal documents related to forestry practices.
10.02 Select proper timber sale contract for given situation and prepare and execute same under supervision of forester and/or legal counsel.
10.03 Prepare and execute equipment lease.
10.04 Prepare and execute land lease under supervision of forester and/or legal counsel.
10.05 Prepare and execute other leases, such as hunting, mineral, bee and grazing, under supervision of forester and/or legal counsel.
10.06 Demonstrate knowledge of equipment insurance.
10.07 Obtain and maintain proper licensure, certifications and registrations.
10.08 Maintain file of network of agencies or other sources of assistance and/or regulation.

11.0 SUPERVISE CONTRACTORS AND SUB-CONTRACTORS--The student will be able to:

11.01 Demonstrate knowledge of various approaches to management of people and/or organizations.

11.02 Communicate clearly and concisely project expectations and requirements, both verbally and written.
11.03 Successfully mediate conflicts involving contractors and sub-contractors.
11.04 Negotiate contracts with contractor and sub-contractor.
11.05 Negotiate and enforce time/work schedules for contractor and sub-contractor.
11.06 Demonstrate knowledge of safety practices and regulations, especially Occupational Safety and Health Administration (O.S.H.A.), related to forestry, and wage and hour laws.

12.0 SUPERVISE AND TRAIN FOREST TECHNICIANS AND OTHER EMPLOYEES--The student will be able to:

12.01 Demonstrate knowledge of various management styles and human personalities.
12.02 Demonstrate knowledge of company, agency or organization management structures.
12.03 Demonstrate knowledge of company, agency or organization objectives, goals and expectations.
12.04 Communicate clearly and concisely with trainee/employee, both verbally and written.
12.05 Demonstrate knowledge of basic teaching-learning techniques and styles.

13.0 DEMONSTRATE COMMUNICATION AND MANAGERIAL SKILLS--The student will be able to:

13.01 Demonstrate ability to communicate properly with others by written and verbal method.
13.02 Identify abilities and limitations of workforce and place workers accordingly.
13.03 Demonstrate knowledge of modern technology such as personal computer, fax machines, copy machines, and portable electronic equipment.
13.04 Properly use telephone systems, including phone etiquette.
13.05 Prepare and deliver public speech to social, civic or other groups.
13.06 Demonstrate basic knowledge of different types of media.
13.07 Prepare media release.
13.08 Prepare a current resume.
13.09 Demonstrate knowledge of interviewing techniques.
13.10 Plan and administer effective work flow and/or trail.

14.0 ADMINISTER THE PURCHASE, SALE AND/OR MARKETING OF FOREST PRODUCTS--The student will be able to:

14.01 Demonstrate knowledge of various forest products and markets.
14.02 Identify Florida forest products and current market valuations.
14.03 Identify timber harvesting systems used in Southeast United States.
14.04 Demonstrate knowledge of operation and maintenance of timber harvesting equipment, including safety practices.
14.05 Prepare and execute a timber sale, either lump sum or per unit.

14.06 Supervise timber harvesting activities.
14.07 Scale forest products.
14.08 Maintain network of forest product manufacturers and/or processors.

15.0 DEMONSTRATE EFFECTIVE HUMAN RESOURCE SKILLS AS A PARAPROFESSIONAL MANAGER--The student will be able to:

15.01 Demonstrate knowledge of supervisory skills.
15.02 Review and evaluate job applications, including resumes.
15.03 Develop appropriate job description.
15.04 Interview prospective employees based on job description.
15.05 Evaluate employees.

16.0 PREPARE AND EFFECT WORK SCHEDULES--The student will be able to:

16.01 Demonstrate knowledge of computer-based scheduling.
16.02 Prepare work schedules utilizing data-bases or spread sheets.
16.03 Manipulate work schedules based on employer and employee needs.
16.04 Demonstrate knowledge of federal, state and local workforce regulations.

17.0 DEMONSTRATE DECISION-MAKING SKILLS--The student will be able to:

17.01 Make appropriate job-related decisions.
17.02 Demonstrate knowledge of listening skills.
17.03 Justify management decisions.
17.04 Encourage employee participation in decision-making process.

18.0 DEMONSTRATE SKILLS IN EFFECTIVE CONFLICT RESOLUTION--The student will be able to:

18.01 Demonstrate basic negotiating skills.
18.02 Demonstrate ability to listen to all factors and all sides of an issue.
18.03 Effect compromise between conflicting parties.
18.04 Create situation where all parties are satisfied with decisions.

01030100CL July 1997

Florida Department of Education
CLUSTER CURRICULUM FRAMEWORK

Cluster Title: Forestry And Natural Resources
Cluster Type: Job Preparatory
Occupational Area: Agriculture And Natural Resources
Components: Two Programs, One Core, and Three Occupational Completion Points

	Secondary	PSAV
Grade Level	9-12, 30, 31	30, 31
Facility Code	203	203
VSO	FFA	PAS
Coop Method	Yes	Yes
Apprenticeship	Yes	Yes

I. **PURPOSE**: The purpose of the programs in this cluster is to prepare students for employment or advanced training in the forestry and natural resources industry. The programs in this cluster also provide supplemental training for persons previously or currently employed in the forestry and natural resources industry.

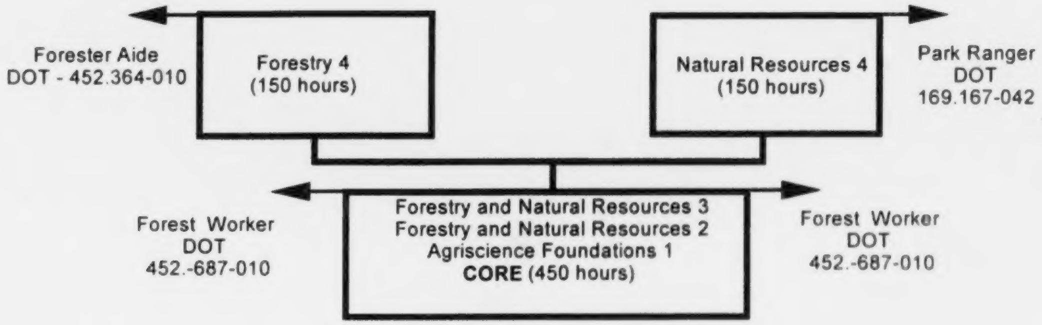
This cluster of programs focuses on broad, transferable skills, stresses the understanding of all aspects of the forestry and natural resources industry, and demonstrates elements of the industry such as planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues, and health, safety, and environmental issues.

II. **CLUSTER STRUCTURE**: This cluster is a planned sequence of instruction consisting of two programs with one common core and three occupational completion points. The recommended sequence allows students to complete specified portions of the program for employment or to remain for advanced training. A student who completes the applicable competencies at any occupational completion point may either continue with the training program or terminate as an occupational completer.

It is recommended that students complete the core or demonstrate a mastery of student performance standards contained in the core before advancing to the course(s) in the next level of either of the programs, Forestry or Natural Resources.

The following diagram illustrates the **CLUSTER STRUCTURE**:

FORESTRY AND NATURAL RESOURCES CLUSTER


Forester Aide
DOT - 452.364-010
Forestry 4
(150 hours)
Natural Resources 4
(150 hours)
Park Ranger
DOT
169.167-042
Forest Worker
DOT
452.-687-010
Forestry and Natural Resources 3
Forestry and Natural Resources 2
Agriscience Foundations 1
CORE (450 hours)
Forest Worker
DOT
452.-687-010

At the secondary level, this cluster consists of the following courses, which include the core:

FORESTRY PROGRAM - 3 secondary credits
CORE
8106810 - Agriscience Foundations 1
8118310 - Forestry and Natural Resources 2
8118320 - Forestry and Natural Resources 3

8118330 - Forestry 4

NATURAL RESOURCES PROGRAM - 4 secondary credits
CORE
8106810 - Agriscience Foundations 1
8118310 - Forestry and Natural Resources 2
8118320 - Forestry and Natural Resources 3

8112110 - Natural Resources 4

III. **SPECIAL NOTE**: The FFA (for secondary) and the National Postsecondary Agricultural Student Organization (for postsecondary) are the appropriate vocational student organization for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Classroom, shop, and laboratory activities are an integral part of this cluster. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes found in the industry. Equipment and supplies should be provided to enhance hands-on experiences for students in their chosen occupation. A generic equipment list is available for the programs in this cluster.

The programs in this cluster may be offered in postsecondary adult vocational (PSAV) courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643, F.S.

The cooperative method of instruction is appropriate for this program. Whenever the cooperative method is offered, the following are required for each student: a training plan that is signed by the student, teacher, and employer,including instructional objectives and a list of on-the-job and in-school learning experiences and a workstation that reflects the equipment, skills, and tasks that are relevant to the occupation that the student has chosen as a career goal. The student must be paid for work performed.

In accordance with Rule 6A-10.040, FAC, the minimum basic skills grade levels required for postsecondary adult vocational students to exit the programs in this cluster are listed before the intended outcomes for each program. These grade-level numbers correspond to grade-equivalent scores obtained on one of the state-designated basic-skills examinations. If a student does not meet the basic-skills level required for completion of the program, remediation should be provided concurrently in the System for Applied Individualized Learning (SAIL). Please refer to the Rule for exemptions.

When a secondary student with a disability is enrolled in a vocational class for which modifications to the curriculum framework have been made, the particular outcomes and student performance standards that the student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEPs. The job title for which the student is being trained must be designated in the IEP.

SCANS Competencies: To accomplish the Secretary's Commission on Achieving Necessary Skills (SCANS) competencies, instructional strategies for this cluster must include methods that require students to identify, organize, and use resources appropriately; to work with each other cooperatively and productively; to acquire and use information; to understand social, organizational, and technological systems; and to work with a variety of tools and equipment. Instructional strategies must also incorporate methods to improve students' personal qualities and higher-order thinking skills.

July 1997

Florida Department of Education
INTENDED OUTCOMES

Program Title: Forestry Program

	Secondary	PSAV
Program Number	**8118300**	**A010314**
CIP Number	0103.049901	0103.049901
Grade Level	9-12, 30, 31	30, 31
Length	4 credits	600 hours
Certification	VOC AGRI @4	VOC AGRI @4
	FORESTRY #7	FORESTRY @7 G
	AGRI @4	AGRI @2 @4
	AGRICULTUR 1 @2	AGRICULTUR 1 @2
	AGRI RES #7	AGRI RES @7 G

Basic-Skills Grade Level	
Math	8
Language	8
Reading	8

INTENDED OUTCOMES: After successfully completing the appropriate outcomes for each occupational completion point of this program, the student will be able to:

OCCUPATIONAL COMPLETION POINT - DATA CODE A
FOREST WORKER - DOT Code 452.687-010

01.0 Describe the socioeconomic role of the agricultural industry.
02.0 Apply scientific and technological principles to the agricultural industry.
03.0 Practice agricultural safety.
04.0 Demonstrate the use of tools, equipment, and instruments in the agricultural industry.
05.0 Describe the principles of integrated pest management (IPM).
06.0 Describe the principles of plant and/or animal growth and reproduction.
07.0 Apply business skills and economic principles to the agricultural industry.
08.0 Explain the basic marketing processes in the agricultural industry.
09.0 Demonstrate human relations, communications, and leadership skills.
10.0 Describe the forestry and natural resources industry.
11.0 Practice forestry and natural resources safety.
12.0 Operate, maintain, and repair machinery, equipment, and facilities.
13.0 Identify the major ecosystems in Florida.
14.0 Monitor water resources.
15.0 Collect and test soil samples.
16.0 Assist in managing wildlife populations.
17.0 Assist in controlling and using fire in forests and other lands.
18.0 Assist in managing forest pests.
19.0 Identify applicable local, state, and federal rules and regulations and assistance programs.
20.0 Apply multi-use principles to forest and other lands.

21.0 Perform basic surveying operations.
22.0 Read and interpret aerial photographs and maps.
23.0 Collect and test water samples.
24.0 Analyze and interpret soil survey data.
25.0 Apply the principles of Best Management Practices (BMP).
26.0 Perform basic nursery operation activities.
27.0 Identify technological advances in the industry.
28.0 Identify wildlife population management practices.
29.0 Identify multi-use principles for forest and other lands.
30.0 Apply basic financial management skills.
31.0 Demonstrate leadership and employability skills.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
FORESTER AIDE - DOT Code 452.364-010

32.0 Apply the principles of basic nursery operations.
33.0 Assist in managing the urban forest.
34.0 Describe timber marketing procedures and techniques.
35.0 Apply business management skills and identify appropriate legal documents.
36.0 Measure trees and forest volume.
37.0 Perform preventive maintenance, checks, and services for forestry equipment.
38.0 Explain the basic silvicultural systems used in forest management.
39.0 Prescribe burning for forest management.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title:	Forestry
Secondary Number:	8118300
Postsecondary Number:	A010314

OCCUPATIONAL COMPLETION POINT - DATA CODE A

FOREST WORKER - DOT Code 452.687-010

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.
02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.

06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.
09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

10.0 DESCRIBE THE FORESTRY AND NATURAL RESOURCES INDUSTRY--The student will be able to:

10.01 Identify career and educational opportunities in the forestry and natural resources industries.
10.02 Describe the importance of forestry and natural resources.
10.03 Identify professional and interest organizations and trade journals in the forestry and natural resources industries.

11.0 PRACTICE FORESTRY AND NATURAL RESOURCES SAFETY--The student will be able to:

11.01 Identify and eliminate hazards of the workplace.
11.02 Observe color-coded warnings in work areas and on equipment and machinery.
11.03 Demonstrate safety procedures and workplace "housekeeping" practices.
11.04 Identify safe and effective fire extinguishing techniques.
11.05 Apply minor first aid treatment and identify emergency procedures.
11.06 Safely handle and store flammable and nonrestricted chemicals.
11.07 Select personal safety equipment and appropriate clothing.
11.08 Operate machinery and equipment according to the safety recommendations of the manufacturers.
11.09 Comply with Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) safety rules and regulations.
11.10 Describe Florida's "Right-to-Know" law (as recorded in the Florida Statutes, Chapter 442).

12.0 OPERATE, MAINTAIN, AND REPAIR MACHINERY, EQUIPMENT, AND FACILITIES--The student will be able to:

12.01 Use the equipment operator, parts, and repair manuals.
12.02 Service and maintain small gasoline engines.
12.03 Operate, service, and maintain tractors and equipment.
12.04 Keep records of the maintenance and repair of equipment and machinery.
12.05 Prepare equipment for storage.
12.06 Use shop and lab instruments and equipment.
12.07 Perform minor welding repairs using arc and oxy-acetylene equipment.
12.08 Maintain and repair facilities.

13.0 IDENTIFY THE MAJOR ECOSYSTEMS IN FLORIDA--The student will be able to:

13.01 Define "ecosystem" and identify the major ecosystems in Florida.
13.02 Identify common plant and animal species of the major ecosystems.
13.03 Identify environmental factors affecting each ecosystem in Florida.
13.04 Identify habitats of the most threatened and endangered plant and animal species in Florida.
13.05 Identify the hydrologic cycle of and the major uses for water.

14.0 MONITOR WATER RESOURCES--The student will be able to:

14.01 Identify important physical and chemical properties of water.
14.02 Identify present and potential sources of water pollution.
14.03 Determine stream flow.
14.04 Monitor water levels of rivers, streams, ponds, and lakes.
14.05 Identify and monitor erosion hazards and environmental quality.

15.0 COLLECT AND TEST SOIL SAMPLES--The student will be able to:

15.01 Identify important physical and chemical properties of soil.
15.02 Collect soil samples representative of an area, complete soil data forms, and submit them for laboratory analysis.
15.03 Test soil for acidity or alkalinity and recommend proper soil additives to correct the pH level.
15.04 Determine the appropriate conservation management practices for planting a particular area.
15.05 Determine land classes according to soil classification standards.

16.0 ASSIST IN MANAGING WILDLIFE POPULATIONS--The student will be able to:

16.01 Prepare a brief report on the history of wildlife management in Florida.
16.02 Identify private, state, and federal agencies that are involved in animal wildlife conservation.
16.03 Interpret wildlife, game, and fishing laws, rules, and regulations.
16.04 Identify the pests, insects, and diseases of common wildlife species.
16.05 Identify the exotic plants and animals that threaten game and nongame species.

17.0 ASSIST IN CONTROLLING AND USING FIRE IN FORESTS AND OTHER LANDS--The student will be able to:

17.01 Identify the major causes of wildfire.
17.02 Assist in determining fire danger in forests and other lands.
17.03 Describe personal safety procedures for forest fire fighters.
17.04 Identify and describe the use of basic tools for forest fire fighting.
17.05 Explain the uses of prescribed burning in forestry, natural resources, and wildlife management.
17.06 Identify the different types of burning assistance that are available through agencies or vendors.

18.0 ASSIST IN MANAGING FOREST PESTS--The student will be able to:

18.01 Identify common forest pests, insects, and diseases.
18.02 Assist with common forest pest control.
18.03 Assist with chemical, mechanical, and other controls of undesirable species.

19.0 IDENTIFY APPLICABLE LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS AND ASSISTANCE PROGRAMS--The student will be able to:

19.01 Locate applicable portions of comprehensive plans.
19.02 Identify agencies affecting land and wildlife utilization.
19.03 Identify agencies regulating employee/employer relations (e.g., the Occupational Safety and Health Administration [OSHA]).
19.04 Identify public- and private-assistance programs for private land owners.
19.05 Describe applicable local, state, and federal rules and regulations.

20.0 APPLY MULTI-USE PRINCIPLES TO FORESTS AND OTHER LANDS--The student will be able to:

20.01 Identify the types of land ownership.
20.02 Assist in preparing a multi-use plan for forests and other lands.

21.0 PERFORM BASIC SURVEYING OPERATIONS--The student will be able to:

21.01 Make linear measurements and calculate an area of land.
21.02 Perform basic surveying operations.
21.03 Locate a land area, using a legal land description.

22.0 READ AND INTERPRET AERIAL PHOTOGRAPHS AND MAPS--The student will be able to:

22.01 Interpret the terms, symbols, and scales used on soil and topographic maps.
22.02 Use maps and aerial photographs for determining acreage.
22.03 Use aerial photographs to identify major timber types and land features.

23.0 COLLECT AND TEST WATER SAMPLES--The student will be able to:

23.01 Collect, store, and label water samples.
23.02 Determine the quality of water samples by measuring for pH, turbidity, dissolved solids, and dissolved oxygen.

24.0 ANALYZE AND INTERPRET SOIL SURVEY DATA--The student will be able to:

24.01 Locate a designated site in the soil survey.
24.02 Analyze and interpret soil survey data.
24.03 Apply soil survey information to silvicultural practices and environmental management.

25.0 APPLY THE PRINCIPLES OF BEST MANAGEMENT PRACTICES (BMP)--The student will be able to:

25.01 Define the terms used in best management practices (BMP).
25.02 Determine erosion and slope coefficients, using the BMP manual.
25.03 Solve problems in land use, applying the principles found in the BMP manual.

26.0 PERFORM BASIC NURSERY OPERATION ACTIVITIES--The student will be able to:

26.01 Identify methods of propagation.
26.02 Perform basic nursery operation activities, such as pruning, trimming, and fertilizing.
26.03 Maintain plants.

27.0 IDENTIFY TECHNOLOGICAL ADVANCES IN THE INDUSTRY--The student will be able to:

27.01 Identify and use basic computer application software.
27.02 Identify satellite surveying operations and laser systems.
27.03 Identify satellite thermal infrared imagery.
27.04 Identify computer mapping systems and geographic information systems.
27.05 Use electronic communication devices.

28.0 IDENTIFY WILDLIFE POPULATION MANAGEMENT PRACTICES--The student will be able to:

28.01 Identify appropriate management practices for a wildlife habitat.
28.02 Identify species of Florida's common wildlife (land and aquatic) and classify them as game, nongame, endangered, or threatened.

29.0 IDENTIFY MULTIUSE PRINCIPLES FOR FOREST AND OTHER LANDS--The student will be able to:

29.01 Identify legal responsibilities for private and public land owners when land is used by the public.
29.02 Identify the different types of leases and their necessary components.

30.0 APPLY BASIC FINANCIAL MANAGEMENT SKILLS--The student will be able to:

30.01 Complete basic financial records.
30.02 Demonstrate the use of banking procedures.
30.03 Calculate interest on loans.
30.04 Complete selected income tax return forms.

31.0 DEMONSTRATE LEADERSHIP AND EMPLOYABILITY SKILLS--The student will be able to:

31.01 Conduct group meetings, using parliamentary procedure and public speaking skills.
31.02 Identify documents that may be required for a job application.
31.03 Complete a job application form.
31.04 Demonstrate competencies in job interview techniques.
31.05 Demonstrate knowledge of how to make job changes appropriately.
31.06 Apply the principles of time management, work simplification, and teamwork when performing assigned tasks.
31.07 Describe the importance of a drug free workplace and the industry policies regarding drug use.

31.08 Demonstrate appropriate responses to performance evaluations from an employer, a supervisor, or other persons in the workplace.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
FORESTER AIDE - DOT Code 452.364-010

32.0 APPLY THE PRINCIPLES OF BASIC NURSERY OPERATIONS--The student will be able to:

32.01 Select the method of, and assist in, site preparation.
32.02 Care for seedlings from the nursery to planting.
32.03 Plant tree seedlings, using a hand or mechanical planter.
32.04 Explain the requirements for reforestation.

33.0 ASSIST IN MANAGING THE URBAN FOREST--The student will be able to:

33.01 Assist in selecting, planting, and transplanting trees in the urban landscape.
33.02 Demonstrate proper tree pruning, trimming, and fertilization techniques.
33.03 Describe the procedure for an urban tree inventory.
33.04 Describe the basic requirements for a tree protection ordinance.
33.05 Develop a vegetative plan for improving wildlife habitat in urban areas.
33.06 Develop a plan for the basic maintenance of tree health.

34.0 DESCRIBE TIMBER MARKETING PROCEDURES AND TECHNIQUES--The student will be able to:

34.01 Identify the products made from trees and other natural resources and their value.
34.02 Select and mark trees to be removed in timber stand improvement.
34.03 Conduct a simple cruise.
34.04 Calculate the volume and value of timber.
34.05 Identify the components of timber sales contracts.
34.06 Identify the methods of harvesting and erosion prevention.

35.0 APPLY BUSINESS MANAGEMENT SKILLS AND IDENTIFY APPROPRIATE LEGAL DOCUMENTS--The student will be able to:

35.01 Identify business liability and the use of liability insurance.
35.02 Identify applicable insurance requirements.
35.03 Identify and complete basic business tax liability forms.
35.04 Identify eligibility requirements for greenbelt, bluebelt, and homestead tax exemptions.
35.05 Interpret enterprise budgets and amortization tables.
35.06 Identify the characteristics of legal documents (such as contracts, deeds, and leases).

36.0 MEASURE TREES AND FOREST VOLUME--The student will be able to:

36.01 Identify and describe the use of tree measuring tools and instruments, such as dendrometers, hypsometers, increment boards, prisms, volume tables, and logger's tape.
36.02 Measure trees and forests, using selected forest measurement tools.

37.0 PERFORM PREVENTIVE MAINTENANCE, CHECKS, AND SERVICES FOR FORESTRY EQUIPMENT--The student will be able to:

37.01 Perform daily operator maintenance checks for equipment.
37.02 Determine the preventive maintenance procedures, using the equipment operator manuals.
37.03 Perform scheduled preventive maintenance procedures.
37.04 Interpret and perform operator's troubleshooting procedures as described in the operator's manual.
37.05 Keep records of the maintenance and servicing of equipment.

38.0 EXPLAIN THE BASIC SILVICULTURAL SYSTEMS USED IN FOREST MANAGEMENT--The student will be able to:

38.01 Identify basic silvicultural systems.
38.02 Conduct a site evaluation.
38.03 Select tree species according to the site evaluation.
38.04 Explain the requirements for tree growth for effective forest management.
38.05 Determine site quality and growth rate for a timber stand.
38.06 Prepare a basic forest management plan, including cost and profit analyses.

39.0 PRESCRIBE BURNING FOR FOREST MANAGEMENT--The student will be able to:

39.01 Develop a plan for a prescribed burning, including permits, maps, and descriptions of desirable burning conditions and fire lines.
39.02 Prepare a smoke management plan.
39.03 Describe the requirements for obtaining different types of burning authorization and the applicable restrictions.
39.04 Prepare a prescribed burning authorization request.
39.05 Explain the effects of fuel characteristics and weather factors on fire behavior.
39.06 Identify the precautions to be followed in using fire as a management tool.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106810
Course Title: Agriscience Foundations I
Course Credit: 1

COURSE DESCRIPTION:

This course was developed as a core and is designed to develop competencies in the areas of agricultural history; global importance of agriculture; career opportunities; applied scientific and technological concepts; ecosystems; agricultural safety; principles of integrated pest management; principles of plant and animal growth; economic principles; agricultural marketing; and human-relations skills.

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.

02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.

09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8118310
Course Title: Forestry and Natural Resources 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of career opportunities; safety; operation, maintenance and repair of machinery, equipment and facilities; soil testing, surveying; water resources; and financial management skills.

10.0 DESCRIBE THE FORESTRY AND NATURAL RESOURCES INDUSTRY--The student will be able to:

10.01 Identify career and educational opportunities in the forestry and natural resources industries.
10.02 Describe the importance of forestry and natural resources.
10.03 Identify professional and interest organizations and trade journals in the forestry and natural resources industries.

11.0 PRACTICE FORESTRY AND NATURAL RESOURCES SAFETY--The student will be able to:

11.01 Identify and eliminate hazards of the workplace.
11.02 Observe color-coded warnings in work areas and on equipment and machinery.
11.03 Demonstrate safety procedures and workplace "housekeeping" practices.
11.04 Identify safe and effective fire extinguishing techniques.
11.05 Apply minor first aid treatment and identify emergency procedures.
11.06 Safely handle and store flammable and nonrestricted chemicals.
11.07 Select personal safety equipment and appropriate clothing.
11.08 Operate machinery and equipment according to the safety recommendations of the manufacturers.

12.0 OPERATE, MAINTAIN, AND REPAIR MACHINERY, EQUIPMENT, AND FACILITIES--The student will be able to:

12.01 Use the equipment operator parts, and repair manuals.
12.02 Service and maintain small gasoline engines.
12.03 Operate, service, and maintain tractors and equipment.
12.06 Use shop and lab instruments and equipment.
12.07 Perform minor welding repairs using arc and oxy-acetylene equipment.

14.0 MONITOR WATER RESOURCES--The student will be able to:

14.01 Identify important physical and chemical properties of water.

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14.02 Identify present and potential sources of water pollution.

15.0 COLLECT AND TEST SOIL SAMPLES--The student will be able to:

15.01 Identify important physical and chemical properties of soil.
15.02 Collect soil samples representative of an area, complete soil data forms, and submit them for laboratory analysis.
15.03 Test soil for acidity or alkalinity and recommend proper soil additives to correct the pH level.
15.04 Determine the appropriate conservation management practices for planting a particular area.
15.05 Determine land classes according to soil classification standards.

20.0 APPLY MULTI-USE PRINCIPLES TO FORESTS AND OTHER LANDS--The student will be able to:

20.01 Identify the types of land ownership.

21.0 PERFORM BASIC SURVEYING OPERATIONS--The student will be able to:

21.01 Make linear measurements and calculate an area of land.
21.02 Perform basic surveying operations.
21.03 Locate a land area, using a legal land description.

22.0 READ AND INTERPRET AERIAL PHOTOGRAPHS AND MAPS--The student will be able to:

22.01 Interpret the terms, symbols, and scales used on soil and topographic maps.

24.0 ANALYZE AND INTERPRET SOIL SURVEY DATA--The student will be able to:

24.01 Locate a designated site in the soil survey.
24.02 Analyze and interpret soil survey data.

26.0 PERFORM BASIC NURSERY OPERATION ACTIVITIES--The student will be able to:

26.01 Identify methods of propagation.
26.02 Perform basic nursery operation activities, such as pruning, trimming, and fertilizing.
26.03 Maintain plants.

30.0 APPLY BASIC FINANCIAL MANAGEMENT SKILLS--The student will be able to:

30.01 Complete basic financial records.
30.02 Demonstrate the use of banking procedures.

31.0 DEMONSTRATE LEADERSHIP AND EMPLOYABILITY SKILLS--The student will be able to:

31.01 Conduct group meetings, using parliamentary procedure and public speaking skills.
31.02 Identify documents that may be required for a job application.

31.03 Complete a job application form.
31.04 Demonstrate competencies in job interview techniques.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8118320
Course Title: Forestry and Natural Resources 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of safety; operation, maintenance, and repair of machinery, equipment and facilities; ecosystems; water resources; wildlife populations; fire use and control; pest management; analyzing and interpreting data.

11.0 PRACTICE FORESTRY AND NATURAL RESOURCES SAFETY--The student will be able to:

- 11.09 Comply with Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) safety rules and regulations.
- 11.10 Describe Florida's "Right-to-Know" law (as recorded in the Florida Statutes, Chapter 442).

12.0 OPERATE, MAINTAIN, AND REPAIR MACHINERY, EQUIPMENT, AND FACILITIES--The student will be able to:

- 12.04 Keep records of the maintenance and repair of equipment and machinery.
- 12.05 Prepare equipment for storage.
- 12.08 Maintain and repair facilities.

13.0 IDENTIFY THE MAJOR ECOSYSTEMS IN FLORIDA--The student will be able to:

- 13.01 Define "ecosystem" and identify the major ecosystems in Florida.
- 13.02 Identify common plant and animal species of the major ecosystems.
- 13.03 Identify environmental factors affecting each ecosystem in Florida.
- 13.04 Identify habitats of the most threatened and endangered plant and animal species in Florida.
- 13.05 Identify the hydrologic cycle of and the major uses for water.

14.0 MONITOR WATER RESOURCES--The student will be able to:

- 14.03 Determine stream flow.
- 14.04 Monitor water levels of rivers, streams, ponds, and lakes.
- 14.05 Identify and monitor erosion hazards and environmental quality.

16.0 ASSIST IN MANAGING WILDLIFE POPULATIONS--The student will be able to:

16.01 Prepare a brief report on the history of wildlife management in Florida.
16.02 Identify private, state, and federal agencies that are involved in animal wildlife conservation.
16.03 Interpret wildlife, game, and fishing laws, rules, and regulations.
16.04 Identify the pests, insects, and diseases of common wildlife species.
16.05 Identify the exotic plants and animals that threaten game and nongame species.

17.0 ASSIST IN CONTROLLING AND USING FIRE IN FORESTS AND OTHER LANDS--The student will be able to:

17.01 Identify the major causes of wildfire.
17.02 Assist in determining fire danger in forests and other lands.
17.03 Describe personal safety procedures for forest fire fighters.
17.04 Identify and describe the use of basic tools for forest fire fighting.
17.05 Explain the uses of prescribed burning in forestry, natural resources, and wildlife management.
17.06 Identify the different types of burning assistance that are available through agencies or vendors.

18.0 ASSIST IN MANAGING FOREST PESTS--The student will be able to:

18.01 Identify common forest pests, insects, and diseases.
18.02 Assist with common forest pest control.
18.03 Assist with chemical, mechanical, and other controls of undesirable species.

19.0 IDENTIFY APPLICABLE LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS AND ASSISTANCE PROGRAMS--The student will be able to:

19.01 Locate applicable portions of comprehensive plans.
19.02 Identify agencies affecting land and wildlife utilization.
19.03 Identify agencies regulating employee/employer relations (e.g., the Occupational Safety and Health Administration [OSHA]).
19.04 Identify public- and private-assistance programs for private-land owners.
19.05 Describe applicable local, state, and federal rules and regulations.

20.0 APPLY MULTI-USE PRINCIPLES TO FORESTS AND OTHER LANDS--The student will be able to:

20.02 Assist in preparing a multi-use plan for forests and other lands.

22.0 READ AND INTERPRET AERIAL PHOTOGRAPHS AND MAPS--The student will be able to:

22.02 Use maps and aerial photographs for determining acreage.

22.03 Use aerial photographs to identify major timber types and land features.

23.0 COLLECT AND TEST WATER SAMPLES--The student will be able to:

23.01 Collect, store, and label water samples.
23.02 Determine the quality of water samples by measuring for pH, turbidity, dissolved solids, and dissolved oxygen.

24.0 ANALYZE AND INTERPRET SOIL SURVEY DATA--The student will be able to:

24.03 Apply soil survey information to silvicultural practices and environmental management.

25.0 APPLY THE PRINCIPLES OF BEST MANAGEMENT PRACTICES (BMP)--The student will be able to:

25.01 Define the terms used in best management practices (BMP).
25.02 Determine erosion and slope coefficients, using the BMP manual.
25.03 Solve problems in land use, applying the principles found in the BMP manual.

27.0 IDENTIFY TECHNOLOGICAL ADVANCES IN THE INDUSTRY--The student will be able to:

27.01 Identify and use basic computer application software.
27.02 Identify satellite surveying operations and laser systems.
27.03 Identify satellite thermal infrared imagery.
27.04 Identify computer mapping systems and geographic information systems.
27.05 Use electronic communication devices.

28.0 IDENTIFY WILDLIFE POPULATION MANAGEMENT PRACTICES--The student will be able to:

28.01 Identify appropriate management practices for a wildlife habitat.
28.02 Identify species of Florida's common wildlife (land and aquatic) and classify them as game, nongame, endangered, or threatened.

29.0 IDENTIFY MULTI-USE PRINCIPLES FOR FOREST AND OTHER LANDS--The student will be able to:

29.01 Identify legal responsibilities for private- and public-land owners when land is used by the public.
29.02 Identify the different types of leases and their necessary components.

30.0 APPLY BASIC FINANCIAL MANAGEMENT SKILLS--The student will be able to:

30.03 Calculate interest on loans.
30.04 Complete selected income tax return forms.

31.0 DEMONSTRATE LEADERSHIP AND EMPLOYABILITY SKILLS--The student will be able to:

31.05 Demonstrate knowledge of how to make job changes appropriately.
31.06 Apply the principles of time management, work simplification, and teamwork when performing assigned tasks.
31.07 Describe the importance of a drug free workplace and the industry policies regarding drug use.
31.08 Demonstrate appropriate responses to performance evaluations from an employer, a supervisor, or other persons in the workplace.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8118330
Course Title: Forestry 4
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of urban forest; timber marketing; business management skills; measuring trees and forest volume; silvicultural systems; prescribed burning; preventative maintenance.

32.0 APPLY THE PRINCIPLES OF BASIC NURSERY OPERATIONS--The student will be able to:

32.01 Select the method of, and assist in, site preparation.
32.02 Care for seedlings from the nursery to planting.
32.03 Plant tree seedlings, using a hand or mechanical planter.
32.04 Explain the requirements for reforestation.

33.0 ASSIST IN MANAGING THE URBAN FOREST--The student will be able to:

33.01 Assist in selecting, planting, and transplanting trees in the urban landscape.
33.02 Demonstrate proper tree pruning, trimming, and fertilization techniques.
33.03 Describe the procedure for an urban tree inventory.
33.04 Describe the basic requirements for a tree protection ordinance.
33.05 Develop a vegetative plan for improving wildlife habitat in urban areas.
33.06 Develop a plan for the basic maintenance of tree health.

34.0 DESCRIBE TIMBER MARKETING PROCEDURES AND TECHNIQUES--The student will be able to:

34.01 Identify the products made from trees and other natural resources and their value.
34.02 Select and mark trees to be removed in timber stand improvement.
34.03 Conduct a simple cruise.
34.04 Calculate the volume and value of timber.
34.05 Identify the components of timber sales contracts.
34.06 Identify the methods of harvesting and erosion prevention.

35.0 APPLY BUSINESS MANAGEMENT SKILLS AND IDENTIFY APPROPRIATE LEGAL DOCUMENTS--The student will be able to:

35.01 Identify business liability and the use of liability insurance.
35.02 Identify applicable insurance requirements.
35.03 Identify and complete basic business tax liability forms.

35.04 Identify eligibility requirements for greenbelt, bluebelt, and homestead tax exemptions.
35.05 Interpret enterprise budgets and amortization tables.
35.06 Identify the characteristics of legal documents (such as contracts, deeds, and leases).

36.0 MEASURE TREES AND FOREST VOLUME--The student will be able to:

36.01 Identify and describe the use of tree measuring tools and instruments, such as dendrometers, hypsometers, increment boards, prisms, volume tables, and logger's tape.
36.02 Measure trees and forests, using selected forest measurement tools.

37.0 PERFORM PREVENTIVE MAINTENANCE, CHECKS, AND SERVICES FOR FORESTRY EQUIPMENT--The student will be able to:

37.01 Perform daily operator maintenance checks for equipment.
37.02 Determine the preventive maintenance procedures, using the equipment operator manuals.
37.03 Perform scheduled preventive maintenance procedures.
37.04 Interpret and perform operator's troubleshooting procedures as described in the operator's manual.
37.05 Keep records of the maintenance and servicing of equipment.

38.0 EXPLAIN THE BASIC SILVICULTURAL SYSTEMS USED IN FOREST MANAGEMENT--The student will be able to:

38.01 Identify basic silvicultural systems.
38.02 Conduct a site evaluation.
38.03 Select tree species according to the site evaluation.
38.04 Explain the requirements for tree growth for effective forest management.
38.05 Determine site quality and growth rate for a timber stand.
38.06 Prepare a basic forest management plan, including cost and profit analyses.

39.0 PRESCRIBE BURNING FOR FOREST MANAGEMENT--The student will be able to:

39.01 Develop a plan for a prescribed burning, including permits, maps, and descriptions of desirable burning conditions and fire lines.
39.02 Prepare a smoke management plan.
39.03 Describe the requirements for obtaining different types of burning authorization and the applicable restrictions.
39.04 Prepare a prescribed burning authorization request.
39.05 Explain the effects of fuel characteristics and weather factors on fire behavior.
39.06 Identify the precautions to be followed in using fire as a management tool.

July 1997

Florida Department of Education
INTENDED OUTCOMES

Program Title: Natural Resources Program

	Secondary	PSAV
Program Number	**8112100**	**A010301**
CIP Number	0103.010100	0103.010100
Grade Level	9-13, 30, 31	30, 31
Length	4 credits	600 hours
Certification	VOC AGRI @4	VOC AGRI @4
	AGRI @4	AGRI @2 @4
	AGRI RES #7	AGRI RES @7 G
	FORESTRY #7	FORESTRY @7 G
	AGRICULTUR 1 @2	AGRICULTUR 1 @2
Basic Skills Grade Level		
Math		8
Language		8
Reading		8

INTENDED OUTCOMES: After successfully completing the appropriate outcomes for each occupational completion point of this program, the student will be able to:

OCCUPATIONAL COMPLETION POINT - DATA CODE A
FOREST WORKER - DOT Code 452.687-010

01.0 Describe the socioeconomic role of the agricultural industry.
02.0 Apply scientific and technological principles to the agricultural industry.
03.0 Practice agricultural safety.
04.0 Demonstrate the use of tools, equipment, and instruments in the agricultural industry.
05.0 Describe the principles of integrated pest management (IPM).
06.0 Describe the principles of plant and/or animal growth and reproduction.
07.0 Apply business skills and economic principles to the agricultural industry.
08.0 Explain the basic marketing processes in the agricultural industry.
09.0 Demonstrate human relations, communications, and leadership skills.
10.0 Describe the forestry and natural resources industry.
11.0 Practice forestry and natural resources safety.
12.0 Operate, maintain, and repair machinery, equipment, and facilities.
13.0 Identify the major ecosystems in Florida.
14.0 Monitor water resources.
15.0 Collect and test soil samples.
16.0 Assist in managing wildlife populations.
17.0 Assist in controlling and using fire in forests and other lands.
18.0 Assist in managing forest pests.
19.0 Identify applicable local, state, and federal rules and regulations and assistance programs.
20.0 Apply multi-use principles to forest and other lands.
21.0 Perform basic surveying operations.

22.0 Read and interpret aerial photographs and maps.
23.0 Collect and test water samples.
24.0 Analyze and interpret soil-survey data.
25.0 Apply the principles of Best Management Practices (BMP).
26.0 Perform basic nursery-operation activities.
27.0 Identify technological advances in the industry.
28.0 Identify wildlife-population management practices.
29.0 Identify multi-use principles for forest and other lands.
30.0 Apply basic financial-management skills.
31.0 Demonstrate leadership and employability skills.

OCCUPATIONAL COMPLETION POINT - DATA CODE B

PARK RANGER - DOT Code 169.167-042

32.0 Describe the practices used in soil conservation.
33.0 Collect, test, and determine quality-of-water samples.
34.0 Identify methods for basic land and water reclamation.
35.0 Explain the principles of managing threatened or endangered species.
36.0 Investigate ecosystems.
37.0 Describe the principles of wildlife management.
38.0 Perform preventive maintenance, checks, and services for equipment specific to the natural resources industry.
39.0 Perform maintenance activities for parks and recreational areas.
40.0 Prescribe burning for natural resources management.
41.0 Explain the multi-use principles of outdoor lands.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Natural Resources
Secondary Number: 8112100
Postsecondary Number: A010301

OCCUPATIONAL COMPLETION POINT - DATA CODE A
FOREST WORKER - DOT Code 452.687-010

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.
02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.

06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.
09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

10.0 DESCRIBE THE FORESTRY AND NATURAL RESOURCES INDUSTRY--The student will be able to:

10.01 Identify career and educational opportunities in the forestry and natural-resources industries.
10.02 Describe the importance of forestry and natural resources.
10.03 Identify professional and interest organizations and trade journals in the forestry and natural-resources industries.

11.0 PRACTICE FORESTRY AND NATURAL RESOURCES SAFETY--The student will be able to:

11.01 Identify and eliminate hazards of the workplace.
11.02 Observe color-coded warnings in work areas and on equipment and machinery.
11.03 Demonstrate safety procedures and workplace "housekeeping" practices.
11.04 Identify safe and effective fire extinguishing techniques.
11.05 Apply minor first aid treatment and identify emergency procedures.
11.06 Safely handle and store flammable and nonrestricted chemicals.
11.07 Select personal safety equipment and appropriate clothing.
11.08 Operate machinery and equipment according to safety recommendations of the manufacturers.
11.09 Comply with Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) safety rules and regulations.
11.10 Describe Florida's "Right-to-Know" law (as recorded in the Florida Statutes, Chapter 442).

12.0 OPERATE, MAINTAIN, AND REPAIR MACHINERY, EQUIPMENT, AND FACILITIES--The student will be able to:

12.01 Use the equipment operator parts, and repair manuals.
12.02 Service and maintain small gasoline engines.
12.03 Operate, service, and maintain tractors and equipment.
12.04 Keep records of the maintenance and repair of equipment and machinery.
12.05 Prepare equipment for storage.
12.06 Use shop and lab instruments and equipment.
12.07 Perform minor welding repairs using arc and oxy-acetylene equipment.
12.08 Maintain and repair facilities.

13.0 IDENTIFY THE MAJOR ECOSYSTEMS IN FLORIDA--The student will be able to:

13.01 Define "ecosystem" and identify the major ecosystems in Florida.
13.02 Identify common plant and animal species of the major ecosystems.
13.03 Identify environmental factors affecting each ecosystem in Florida.
13.04 Identify habitats of the most threatened and endangered plant and animal species in Florida.
13.05 Identify the hydrologic cycle of and the major uses for water.

14.0 MONITOR WATER RESOURCES--The student will be able to:

14.01 Identify important physical and chemical properties of water.
14.02 Identify present and potential sources of water pollution.
14.03 Determine stream flow.
14.04 Monitor water levels of rivers, streams, ponds, and lakes.
14.05 Identify and monitor erosion hazards and environmental quality.

15.0 COLLECT AND TEST SOIL SAMPLES--The student will be able to:

15.01 Identify important physical and chemical properties of soil.
15.02 Collect soil samples representative of an area, complete soil-data forms, and submit them for laboratory analysis.
15.03 Test soil for acidity or alkalinity and recommend proper soil additives to correct the pH level.
15.04 Determine the appropriate conservation management practices for planting a particular area.
15.05 Determine land classes according to soil classification standards.

16.0 ASSIST IN MANAGING WILDLIFE POPULATIONS--The student will be able to:

16.01 Prepare a brief report on the history of wildlife management in Florida.
16.02 Identify private, state, and federal agencies that are involved in animal wildlife conservation.
16.03 Interpret wildlife, game, and fishing laws, rules, and regulations.
16.04 Identify the pests, insects, and diseases of common wildlife species.
16.05 Identify exotic plants and animals that threaten game and nongame species.

17.0 ASSIST IN CONTROLLING AND USING FIRE IN FORESTS AND OTHER LANDS--The student will be able to:

17.01 Identify the major causes of wildfire.
17.02 Assist in determining fire danger in forests and other lands.
17.03 Describe personal safety procedures for forest-fire fighters.
17.04 Identify and describe the use of basic tools for forest-fire fighting.
17.05 Explain the uses of prescribed burning in forestry, natural resources, and wildlife management.
17.06 Identify the different types of burning assistance that are available through agencies or vendors.

18.0 ASSIST IN MANAGING FOREST PESTS--The student will be able to:

18.01 Identify common forest pests, insects, and diseases.
18.02 Assist with common forest pest control.
18.03 Assist with chemical, mechanical, and other controls of undesirable species.

19.0 IDENTIFY APPLICABLE LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS AND ASSISTANCE PROGRAMS--The student will be able to:

19.01 Locate applicable portions of comprehensive plans.
19.02 Identify agencies affecting land and wildlife utilization.
19.03 Identify agencies regulating employee/employer relations (e.g., OSHA).
19.04 Identify public and private assistance programs for private land owners.
19.05 Describe applicable local, state, and federal rules and regulations.

20.0 APPLY MULTI-USE PRINCIPLES TO FORESTS AND OTHER LANDS--The student will be able to:

20.01 Identify the types of land ownership.
20.02 Assist in preparing a multi-use plan for forests and other lands.

21.0 PERFORM BASIC SURVEYING OPERATIONS--The student will be able to:

21.01 Make linear measurements and calculate an area of land.
21.02 Perform basic surveying operations.
21.03 Locate a land area, using a legal land description.

22.0 READ AND INTERPRET AERIAL PHOTOGRAPHS AND MAPS--The student will be able to:

22.01 Interpret the terms, symbols, and scales used on soil and topographic maps.
22.02 Use maps and aerial photographs for determining acreage.
22.03 Use aerial photographs to identify major timber types and land features.

23.0 COLLECT AND TEST WATER SAMPLES--The student will be able to:

23.01 Collect, store, and label water samples.
23.02 Determine the quality of water samples by measuring for pH, turbidity, dissolved solids, and dissolved oxygen.

24.0 ANALYZE AND INTERPRET SOIL SURVEY DATA--The student will be able to:

24.01 Locate a designated site in the soil survey.
24.02 Analyze and interpret soil survey data.
24.03 Apply soil survey information to silvicultural practices and environmental management.

25.0 APPLY THE PRINCIPLES OF BEST MANAGEMENT PRACTICES (BMP)--The student will be able to:

25.01 Define the terms used in best management practices (BMP).
25.02 Determine erosion and slope coefficients, using the BMP manual.
25.03 Solve problems in land use, applying the principles found in the BMP manual.

26.0 PERFORM BASIC NURSERY OPERATION ACTIVITIES--The student will be able to:

26.01 Identify methods of propagation.
26.02 Perform basic nursery operation activities, such as pruning, trimming, and fertilizing.
26.03 Maintain plants.

27.0 IDENTIFY TECHNOLOGICAL ADVANCES IN THE INDUSTRY--The student will be able to:

27.01 Identify and use basic computer application software.
27.02 Identify satellite surveying operations and laser systems.
27.03 Identify satellite thermal infrared imagery.
27.04 Identify computer mapping systems and geographic-information systems.
27.05 Use electronic communication devices.

28.0 IDENTIFY WILDLIFE POPULATION MANAGEMENT PRACTICES--The student will be able to:

28.01 Identify appropriate management practices for a wildlife habitat.
28.02 Identify species of Florida's common wildlife (land and aquatic) and classify them as game, nongame, endangered, or threatened.

29.0 IDENTIFY MULTI-USE PRINCIPLES FOR FOREST AND OTHER LANDS--The student will be able to:

29.01 Identify legal responsibilities for private and public land owners when land is used by the public.
29.02 Identify the different types of leases and their necessary components.

30.0 APPLY BASIC FINANCIAL MANAGEMENT SKILLS--The student will be able to:

30.01 Complete basic financial records.
30.02 Demonstrate the use of banking procedures.
30.03 Calculate interest on loans.
30.04 Complete selected income tax return forms.

31.0 DEMONSTRATE LEADERSHIP AND EMPLOYABILITY SKILLS--The student will be able to:

31.01 Conduct group meetings, using parliamentary procedure and public-speaking skills.
31.02 Identify documents that may be required for a job application.
31.03 Complete a job application form.
31.04 Demonstrate competencies in job interview techniques.
31.05 Demonstrate knowledge of how to make job changes appropriately.
31.06 Apply the principles of time management, work simplification, and teamwork when performing assigned tasks.
31.07 Describe the importance of a drug free workplace and the industry policies regarding drug use.

31.08 Demonstrate appropriate responses to performance evaluations from an employer, a supervisor, or other persons in the workplace.

OCCUPATIONAL COMPLETION POINT - DATA CODE B

PARK RANGER - DOT Code 169.167-042

32.0 DESCRIBE PRACTICES IN SOIL CONSERVATION--The student will be able to:

32.01 Locate a designated site, using a soil survey map.
32.02 Analyze and interpret soil survey data.
32.03 Apply soil survey information to silvicultural practices and environmental management.
32.04 Describe practices in soil conservation.

33.0 COLLECT, TEST, AND DETERMINE THE QUALITY-OF-WATER SAMPLES--The student will be able to:

33.01 Collect, store, and label water samples.
33.02 Determine the quality-of-water samples by measuring for pH, turbidity, dissolved solids and dissolved oxygen.
33.03 Investigate watershed boundaries and drainage patterns.
33.04 Calculate the volume and surface area of ponds, lakes, and streams.
33.05 Assist in planning the improvements of waterways, ponds, stream banks, and shorelines.

34.0 IDENTIFY METHODS FOR BASIC LAND AND WATER RECLAMATION--The student will be able to:

34.01 Explain requirements for the regeneration of indigenous plant species.
34.02 Identify the needs and benefits of land and water reclamation.
34.03 Identify the methods for basic land and water reclamation.

35.0 EXPLAIN THE PRINCIPLES OF MANAGING THREATENED OR ENDANGERED SPECIES--The student will be able to:

35.01 Identify threatened or endangered species in the local area.
35.02 Explain the importance of saving the threatened or endangered species.
35.03 Explain the interdependency of threatened or endangered species and environmental factors affecting them.
35.04 Identify and locate rules and regulations on managing threatened and endangered species.
35.05 Interpret the recovery plans for the threatened or endangered species.

36.0 INVESTIGATE ECOSYSTEMS--The student will be able to:

36.01 Explain how ecosystems interact with each other.
36.02 Describe transition zones and investigate life in a transition zone.
36.03 Investigate and analyze human influence on ecosystems.

36.04 Explain the meteorological aspects of ecosystems.
36.05 Investigate and analyze the impact of pollution on ecosystems.

37.0 DESCRIBE THE PRINCIPLES OF WILDLIFE MANAGEMENT--The student will be able to:

37.01 Describe the characteristics of wildlife population dynamics.
37.02 Survey the wildlife in selected ecosystems and identify its food web.
37.03 Describe game and nongame wildlife programs in Florida, including those that purchase and protect wildlife habitats.
37.04 Identify rules and regulations that affect game and nongame wildlife.

38.0 PERFORM PREVENTIVE MAINTENANCE, CHECKS, AND SERVICES FOR EQUIPMENT SPECIFIC TO THE NATURAL RESOURCES INDUSTRY--The student will be able to:

38.01 Perform daily operator maintenance checks for equipment.
38.02 Determine preventive maintenance procedures, using the equipment operator manuals.
38.03 Perform scheduled preventive maintenance procedures.
38.04 Interpret and perform operator's troubleshooting procedures as described in the manual.
38.05 Keep records of the maintenance and servicing of equipment.

39.0 PERFORM MAINTENANCE ACTIVITIES FOR PARKS AND RECREATIONAL AREAS--The student will be able to:

39.01 Identify outdoor use organizations and describe their purposes and functions.
39.02 Explain the dynamics of using volunteers in parks and in recreational and other outdoor areas.
39.03 Perform maintenance activities in parks and in recreational and other outdoor areas.
39.04 Identify rules and regulations that pertain to the management of parks and recreational areas, including those relating to security.
39.05 Construct a selected recreational structure, such as a sign, a wildlife nesting shelter, and a picnic table.
39.06 Develop a basic design for a recreational area.

40.0 PRESCRIBE BURNING FOR NATURAL RESOURCES MANAGEMENT--The student will be able to:

40.01 Develop a plan for a prescribed burning, including permits, maps, and descriptions of desirable burning conditions and fire lines.
40.02 Prepare a smoke management plan.
40.03 Describe the requirements for obtaining different types of burning authorization and the applicable restrictions.
40.04 Prepare a prescribed burning authorization request.
40.05 Explain the effects of fuel characteristics and weather factors on fire behavior.

40.06 Identify the precautions to be followed in using fire as a management tool.

41.0 EXPLAIN THE MULTI-USE PRINCIPLES OF OUTDOOR LANDS--The student will be able to:

41.01 Explain policies for dealing with park visitors.
41.02 Demonstrate the safe use and maintenance of common outdoor equipment.
41.03 Interpret park and campground rules, regulations, and historical and natural features for park visitors.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106810
Course Title: Agriscience Foundations I
Course Credit: 1

COURSE DESCRIPTION:

This course was developed as a core and is designed to develop competencies in the areas of agricultural history; global importance of agriculture; career opportunities; applied scientific and technological concepts; ecosystems; agricultural safety; principles of integrated pest management; principles of plant and animal growth; economic principles; agricultural marketing; and human-relations skills.

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.

02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.

09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8118310
Course Title: Forestry and Natural Resources 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of career opportunities; safety; operation, maintenance and repair of machinery, equipment and facilities; soil testing, surveying; water resources; and financial management skills.

10.0 DESCRIBE THE FORESTRY AND NATURAL RESOURCES INDUSTRY--The student will be able to:

10.01 Identify career and educational opportunities in the forestry and natural resources industries.
10.02 Describe the importance of forestry and natural resources.
10.03 Identify professional and interest organizations and trade journals in the forestry and natural resources industries.

11.0 PRACTICE FORESTRY AND NATURAL RESOURCES SAFETY--The student will be able to:

11.01 Identify and eliminate hazards of the workplace.
11.02 Observe color-coded warnings in work areas and on equipment and machinery.
11.03 Demonstrate safety procedures and workplace "housekeeping" practices.
11.04 Identify safe and effective fire extinguishing techniques.
11.05 Apply minor first aid treatment and identify emergency procedures.
11.06 Safely handle and store flammable and nonrestricted chemicals.
11.07 Select personal safety equipment and appropriate clothing.
11.08 Operate machinery and equipment according to the safety recommendations of the manufacturers.

12.0 OPERATE, MAINTAIN, AND REPAIR MACHINERY, EQUIPMENT, AND FACILITIES--The student will be able to:

12.01 Use the equipment operator parts, and repair manuals.
12.02 Service and maintain small gasoline engines.
12.03 Operate, service, and maintain tractors and equipment.
12.06 Use shop and lab instruments and equipment.
12.07 Perform minor welding repairs using arc and oxy-acetylene equipment.

14.0 MONITOR WATER RESOURCES--The student will be able to:

14.01 Identify important physical and chemical properties of water.

14.02 Identify present and potential sources of water pollution.

15.0 COLLECT AND TEST SOIL SAMPLES--The student will be able to:

15.01 Identify important physical and chemical properties of soil.
15.02 Collect soil samples representative of an area, complete soil data forms, and submit them for laboratory analysis.
15.03 Test soil for acidity or alkalinity and recommend proper soil additives to correct the pH level.
15.04 Determine the appropriate conservation management practices for planting a particular area.
15.05 Determine land classes according to soil classification standards.

20.0 APPLY MULTI-USE PRINCIPLES TO FORESTS AND OTHER LANDS--The student will be able to:

20.01 Identify the types of land ownership.

21.0 PERFORM BASIC SURVEYING OPERATIONS--The student will be able to:

21.01 Make linear measurements and calculate an area of land.
21.02 Perform basic surveying operations.
21.03 Locate a land area, using a legal land description.

22.0 READ AND INTERPRET AERIAL PHOTOGRAPHS AND MAPS--The student will be able to:

22.01 Interpret the terms, symbols, and scales used on soil and topographic maps.

24.0 ANALYZE AND INTERPRET SOIL SURVEY DATA--The student will be able to:

24.01 Locate a designated site in the soil survey.
24.02 Analyze and interpret soil survey data.

26.0 PERFORM BASIC NURSERY OPERATION ACTIVITIES--The student will be able to:

26.01 Identify methods of propagation.
26.02 Perform basic nursery operation activities, such as pruning, trimming, and fertilizing.
26.03 Maintain plants.

30.0 APPLY BASIC FINANCIAL MANAGEMENT SKILLS--The student will be able to:

30.01 Complete basic financial records.
30.02 Demonstrate the use of banking procedures.

31.0 DEMONSTRATE LEADERSHIP AND EMPLOYABILITY SKILLS--The student will be able to:

31.01 Conduct group meetings, using parliamentary procedure and public speaking skills.
31.02 Identify documents that may be required for a job application.

31.03 Complete a job application form.
31.04 Demonstrate competencies in job interview techniques.

Program: 8112100 Natural Resources

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8118320
Course Title: Forestry and Natural Resources 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of safety; operation, maintenance, and repair of machinery, equipment and facilities; ecosystems; water resources; wildlife populations; fire use and control; pest management; analyzing and interpreting data.

11.0 PRACTICE FORESTRY AND NATURAL RESOURCES SAFETY--The student will be able to:

- 11.09 Comply with Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) safety rules and regulations.
- 11.10 Describe Florida's "Right-to-Know" law (as recorded in the Florida Statutes, Chapter 442).

12.0 OPERATE, MAINTAIN, AND REPAIR MACHINERY, EQUIPMENT, AND FACILITIES--The student will be able to:

- 12.04 Keep records of the maintenance and repair of equipment and machinery.
- 12.05 Prepare equipment for storage.
- 12.08 Maintain and repair facilities.

13.0 IDENTIFY THE MAJOR ECOSYSTEMS IN FLORIDA--The student will be able to:

- 13.01 Define "ecosystem" and identify the major ecosystems in Florida.
- 13.02 Identify common plant and animal species of the major ecosystems.
- 13.03 Identify environmental factors affecting each ecosystem in Florida.
- 13.04 Identify habitats of the most threatened and endangered plant and animal species in Florida.
- 13.05 Identify the hydrologic cycle of and the major uses for water.

14.0 MONITOR WATER RESOURCES--The student will be able to:

- 14.03 Determine stream flow.
- 14.04 Monitor water levels of rivers, streams, ponds, and lakes.
- 14.05 Identify and monitor erosion hazards and environmental quality.

16.0 ASSIST IN MANAGING WILDLIFE POPULATIONS--The student will be able to:

16.01 Prepare a brief report on the history of wildlife management in Florida.
16.02 Identify private, state, and federal agencies that are involved in animal wildlife conservation.
16.03 Interpret wildlife, game, and fishing laws, rules, and regulations.
16.04 Identify the pests, insects, and diseases of common wildlife species.
16.05 Identify the exotic plants and animals that threaten game and nongame species.

17.0 ASSIST IN CONTROLLING AND USING FIRE IN FORESTS AND OTHER LANDS--The student will be able to:

17.01 Identify the major causes of wildfire.
17.02 Assist in determining fire danger in forests and other lands.
17.03 Describe personal safety procedures for forest fire fighters.
17.04 Identify and describe the use of basic tools for forest fire fighting.
17.05 Explain the uses of prescribed burning in forestry, natural resources, and wildlife management.
17.06 Identify the different types of burning assistance that are available through agencies or vendors.

18.0 ASSIST IN MANAGING FOREST PESTS--The student will be able to:

18.01 Identify common forest pests, insects, and diseases.
18.02 Assist with common forest pest control.
18.03 Assist with chemical, mechanical, and other controls of undesirable species.

19.0 IDENTIFY APPLICABLE LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS AND ASSISTANCE PROGRAMS--The student will be able to:

19.01 Locate applicable portions of comprehensive plans.
19.02 Identify agencies affecting land and wildlife utilization.
19.03 Identify agencies regulating employee/employer relations (e.g., the Occupational Safety and Health Administration [OSHA]).
19.04 Identify public- and private-assistance programs for private-land owners.
19.05 Describe applicable local, state, and federal rules and regulations.

20.0 APPLY MULTI-USE PRINCIPLES TO FORESTS AND OTHER LANDS--The student will be able to:

20.02 Assist in preparing a multi-use plan for forests and other lands.

22.0 READ AND INTERPRET AERIAL PHOTOGRAPHS AND MAPS--The student will be able to:

22.02 Use maps and aerial photographs for determining acreage.

22.03 Use aerial photographs to identify major timber types and land features.

23.0 COLLECT AND TEST WATER SAMPLES--The student will be able to:

23.01 Collect, store, and label water samples.
23.02 Determine the quality of water samples by measuring for pH, turbidity, dissolved solids, and dissolved oxygen.

24.0 ANALYZE AND INTERPRET SOIL SURVEY DATA--The student will be able to:

24.03 Apply soil survey information to silvicultural practices and environmental management.

25.0 APPLY THE PRINCIPLES OF BEST MANAGEMENT PRACTICES (BMP)--The student will be able to:

25.01 Define the terms used in best management practices (BMP).
25.02 Determine erosion and slope coefficients, using the BMP manual.
25.03 Solve problems in land use, applying the principles found in the BMP manual.

27.0 IDENTIFY TECHNOLOGICAL ADVANCES IN THE INDUSTRY--The student will be able to:

27.01 Identify and use basic computer application software.
27.02 Identify satellite surveying operations and laser systems.
27.03 Identify satellite thermal infrared imagery.
27.04 Identify computer mapping systems and geographic information systems.
27.05 Use electronic communication devices.

28.0 IDENTIFY WILDLIFE POPULATION MANAGEMENT PRACTICES--The student will be able to:

28.01 Identify appropriate management practices for a wildlife habitat.
28.02 Identify species of Florida's common wildlife (land and aquatic) and classify them as game, nongame, endangered, or threatened.

29.0 IDENTIFY MULTI-USE PRINCIPLES FOR FOREST AND OTHER LANDS--The student will be able to:

29.01 Identify legal responsibilities for private- and public-land owners when land is used by the public.
29.02 Identify the different types of leases and their necessary components.

30.0 APPLY BASIC FINANCIAL MANAGEMENT SKILLS--The student will be able to:

30.03 Calculate interest on loans.
30.04 Complete selected income tax return forms.

31.0 DEMONSTRATE LEADERSHIP AND EMPLOYABILITY SKILLS--The student will be able to:

31.05 Demonstrate knowledge of how to make job changes appropriately.
31.06 Apply the principles of time management, work simplification, and teamwork when performing assigned tasks.
31.07 Describe the importance of a drug free workplace and the industry policies regarding drug use.
31.08 Demonstrate appropriate responses to performance evaluations from an employer, a supervisor, or other persons in the workplace.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8112110
Course Title: Natural Resources 4
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in soil conservation; water quality; water reclamation; endangered species; ecosystems; wildlife management; prescribed burning; and multiuse principles of outdoor lands.

32.0 DESCRIBE PRACTICES IN SOIL CONSERVATION--The student will be able to:

- 32.01 Locate a designated site, using a soil survey map.
- 32.02 Analyze and interpret soil survey data.
- 32.03 Apply soil survey information to silvicultural practices and environmental management.
- 32.04 Describe practices in soil conservation.

33.0 COLLECT, TEST, AND DETERMINE THE QUALITY-OF-WATER SAMPLES--The student will be able to:

- 33.01 Collect, store, and label water samples.
- 33.02 Determine the quality-of-water samples by measuring for pH, turbidity, dissolved solids and dissolved oxygen.
- 33.03 Investigate watershed boundaries and drainage patterns.
- 33.04 Calculate the volume and surface area of ponds, lakes, and streams.
- 33.05 Assist in planning the improvements of waterways, ponds, stream banks, and shorelines.

34.0 IDENTIFY METHODS FOR BASIC LAND AND WATER RECLAMATION--The student will be able to:

- 34.01 Explain requirements for the regeneration of indigenous plant species.
- 34.02 Identify the needs and benefits of land and water reclamation.
- 34.03 Identify the methods for basic land and water reclamation.

35.0 EXPLAIN THE PRINCIPLES OF MANAGING THREATENED OR ENDANGERED SPECIES--The student will be able to:

- 35.01 Identify threatened or endangered species in the local area.
- 35.02 Explain the importance of saving the threatened or endangered species.
- 35.03 Explain the interdependency of threatened or endangered species and environmental factors affecting them.
- 35.04 Identify and locate rules and regulations on managing threatened and endangered species.

35.05 Interpret the recovery plans for the threatened or endangered species.

36.0 INVESTIGATE ECOSYSTEMS--The student will be able to:

36.01 Explain how ecosystems interact with each other.
36.02 Describe transition zones and investigate life in a transition zone.
36.03 Investigate and analyze human influence on ecosystems.
36.04 Explain the meteorological aspects of ecosystems.
36.05 Investigate and analyze the impact of pollution on ecosystems.

37.0 DESCRIBE THE PRINCIPLES OF WILDLIFE MANAGEMENT--The student will be able to:

37.01 Describe the characteristics of wildlife population dynamics.
37.02 Survey the wildlife in selected ecosystems and identify its food web.
37.03 Describe game and nongame wildlife programs in Florida, including those that purchase and protect wildlife habitats.
37.04 Identify rules and regulations that affect game and nongame wildlife.

38.0 PERFORM PREVENTIVE MAINTENANCE, CHECKS, AND SERVICES FOR EQUIPMENT SPECIFIC TO THE NATURAL RESOURCES INDUSTRY--The student will be able to:

38.01 Perform daily operator maintenance checks for equipment.
38.02 Determine preventive maintenance procedures, using the equipment operator manuals.
38.03 Perform scheduled preventive maintenance procedures.
38.04 Interpret and perform operator's troubleshooting procedures as described in the manual.
38.05 Keep records of the maintenance and servicing of equipment.

39.0 PERFORM MAINTENANCE ACTIVITIES FOR PARKS AND RECREATIONAL AREAS--The student will be able to:

39.01 Identify outdoor-use organizations and describe their purposes and functions.
39.02 Explain the dynamics of using volunteers in parks and in recreational and other outdoor areas.
39.03 Perform maintenance activities in parks and in recreational and other outdoor areas.
39.04 Identify rules and regulations that pertain to the management of parks and recreational areas, including those relating to security.
39.05 Construct a selected recreational structure, such as a sign, a wildlife nesting shelter, and a picnic table.
39.06 Develop a basic design for a recreational area.

40.0 PRESCRIBE BURNING FOR NATURAL RESOURCES MANAGEMENT--The student will be able to:

40.01 Develop a plan for a prescribed burning, including permits, maps, and descriptions of desirable burning conditions and fire lines.
40.02 Prepare a smoke management plan.
40.03 Describe the requirements for obtaining different types of burning authorization and the applicable restrictions.
40.04 Prepare a prescribed burning authorization request.
40.05 Explain the effects of fuel characteristics and weather factors on fire behavior.
40.06 Identify the precautions to be followed in using fire as a management tool.

41.0 EXPLAIN THE MULTIUSE PRINCIPLES OF OUTDOOR LANDS--The student will be able to:

41.01 Explain policies for dealing with park visitors.
41.02 Demonstrate the safe use and maintenance of common outdoor equipment.
41.03 Interpret park and campground rules, regulations, and historical and natural features for park visitors.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Forest Technology
Occupational Area:	Agriculture
	PSV
CIP Number	0103.050600
Grade Level	College Credits
Length	AS Degree
Certification	

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment as forester, conservation scientist (24302077), forest technicians, forest ecologists (040.061-030), silviculturists (040.061-050), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, instruction that prepares individuals to manage and administer forests and forest lands. Instruction also includes silviculture, forest protection, planning, economics, forest mensuration, surveying, photogrammetry, human relations, law and dendrology.

II. **LABORATORY ACTIVITIES**: Forest laboratory activities are an integral part of this program including the safe use of mechanics' hand tools, field hand tools, forest fire control equipment, forest measurement instruments, forest tractors and field equipment, and chemical applicators.

III. **SPECIAL NOTE**: National Postsecondary Agricultural Student Organization is the appropriate vocational student organization for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Planned and supervised occupational activities may be provided through directed laboratory experience, practicum or cooperative experience. Whenever the cooperative method of instruction is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks which are relevant to the occupation which the student has chosen as a career goal. The student must receive compensation for work performed.

The typical length of this program for the average achieving student is an associate degree. The standard credit hour length for this program is 63 hours.

IV. **INTENDED OUTCOMES**: After successfully completing this program, the student will be able to:

01.0 Survey and measure forests.
02.0 Assist in preparation of and implement forest management plans.
03.0 Supervise the protection of forests and woodlands.
04.0 Evaluate the forest ecosystem.
05.0 Analyze contracts, leases and other legal documents.
06.0 Keep and analyze records.
07.0 Analyze technical information and incorporate into management of operation.
08.0 Supervise and train employees.
09.0 Demonstrate leadership, communication, employability, public and human relations skills.
10.0 Market wood products.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Forest Technology
Secondary Number:
Postsecondary Number: 0103.050600

01.0 SURVEY AND MEASURE FORESTS--The student will be able to:

01.01 Identify parcels of land based on legal descriptions.
01.02 Interpret aerial photographs.
01.03 Survey forest boundaries and acreage.
01.04 Produce a finished map of forested areas.
01.05 Determine forest topography.
01.06 Operate current tree measuring devices.
01.07 Estimate timber volumes by product.
01.08 Select and use tree volume tables.
01.09 Demonstrate use of the wedge prism.
01.10 Develop a timber stand growth projection.
01.11 Demonstrate sampling techniques.
01.12 Determine forest stocking rate.

02.0 ASSIST IN PREPARATION OF AND IMPLEMENT FOREST MANAGEMENT PLANS--The student will be able to:

02.01 Evaluate forest data.
02.02 Assist in the formulation of management guidelines.
02.03 Conduct a timber stand improvement operation.
02.04 Plan and execute a prescribed burn.
02.05 Demonstrate various firing techniques for prescribed burning.
02.06 Select trees for removal in an improvement cut.
02.07 Select seed trees for natural regeneration.
02.08 Conduct site preparation.
02.09 Supervise tree planting operations.
02.10 Monitor timber harvesting operations.
02.11 Assist in the development of a multiple use management plan.
02.12 Implement practices to enhance wildlife habitat.
02.13 Construct and maintain recreational facilities.

03.0 SUPERVISE THE PROTECTION OF FORESTS AND WOODLANDS--The student will be able to:

03.01 Use fire as a management tool to reduce fire hazards, insects and diseases.
03.02 Select, use and maintain hand tools to suppress a fire.
03.03 Demonstrate the selection and use of mechanical equipment to suppress fire.
03.04 Demonstrate knowledge of environmental conditions affecting fire control and behavior.
03.05 Determine the damaging effects of wildfire on forest areas.
03.06 Demonstrate suppression burning.
03.07 Identify forest insects.
03.08 Describe insect population dynamics.

03.09 Describe stress agents of forest trees.
03.10 Prevent and control stress agents of forest trees.
03.11 Describe elements of chemical control and biological control of forest pests.
03.12 Recognize symptoms of insect and disease damage to forest trees.
03.13 Identify insecticides used to control forest insects.
03.14 Identify common forest tree diseases.
03.15 Determine the feasibility of controlling forest tree insects and diseases.
03.16 Demonstrate knowledge of maladies or tree disorders other than insects and diseases.
03.17 Demonstrate safe fire fighting techniques.

04.0 EVALUATE THE FOREST ECOSYSTEM--The student will be able to:

04.01 Identify and classify forest soils.
04.02 Identify and classify forest flora and fauna.
04.03 Identify forest types.
04.04 Identify commercial forest trees and their habitats.
04.05 Identify the interrelationship between site, flora and fauna.

05.0 ANALYZE CONTRACTS, LEASES AND OTHER LEGAL DOCUMENTS--The student will be able to:

05.01 Analyze a timber sale contract.
05.02 Analyze an equipment lease agreement.
05.03 Analyze a land lease agreement.
05.04 Determine sources of legal assistance.
05.05 Determine agencies or sources of legal information.
05.06 Obtain and maintain licenses, authorizations, certificates and registrations.
05.07 Observe federal, state and local laws and regulations relative to forestry.
05.08 Identify regulatory and assisting agencies.

06.0 KEEP AND ANALYZE RECORDS--The student will be able to:

06.01 Keep and maintain equipment service and maintenance records.
06.02 Maintain fiscal documents.
06.03 Maintain personnel records.
06.04 Record and report accidents.
06.05 Maintain a historical file on forestry practices.
06.06 Base decisions on the analysis of records.
06.07 Determine fixed costs, interest capitalization and depreciation schedules.
06.08 Maintain inventory records.

07.0 ANALYZE TECHNICAL INFORMATION AND INCORPORATE INTO MANAGEMENT OF OPERATION--The student will be able to:

07.01 Maintain a current file of technical information.
07.02 Improve skills and knowledge through seminars and workshops.
07.03 Interpret and apply technical information.

07.04 Identify governmental and private agencies providing technical assistance.

08.0 SUPERVISE AND TRAIN EMPLOYEES--The student will be able to:

08.01 Supervise timber markers, insect spray crews, hand planting and fire suppression crews.
08.02 Train and supervise employees in the use of tools and equipment used in the forest.
08.03 Instruct employees in policies and procedures.
08.04 Evaluate personnel.
08.05 Instruct and monitor employee safety.

09.0 DEMONSTRATE LEADERSHIP, COMMUNICATION, EMPLOYABILITY, PUBLIC AND HUMAN RELATIONS SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a job.
09.03 Identify documents that may be required when applying for a job.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
09.07 Identify acceptable work habits.
09.08 Demonstrate knowledge of how to make job changes appropriately.
09.09 Demonstrate acceptable employee health habits.

10.0 MARKET WOOD PRODUCTS--The student will be able to:

10.01 Identify potential markets for wood and wood products.
10.02 Obtain up-to-date marketing information.
10.03 Identify characteristics of timber harvesting systems.
10.04 Conduct a timber sale.
10.05 Identify equipment used in the processing of wood products.
10.06 Grade logs and lumber.
10.07 Identify methods of processing wood and wood products.
10.08 Scale pulpwood and saw logs.

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July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Golf Course Operations
Occupational Area:	Agriculture
	PSV
CIP Number	0101.060701
Grade Level	College Credits
Length	AS Degree
Certification	

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment as golf course superintendents, superintendents, greens (406.137-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, instruction that prepares individuals to supervise and manage the operations of a golf course. Instruction includes equipment management, pest control, fertilization, care, irrigation, record keeping, safety, laws and regulations, as well as leadership, public relations, human relations, employability and communication skills.

II. **LABORATORY ACTIVITIES**: Shop and golf course field laboratory activities are an integral part of this program including the safe use of mechanics' hand tools, irrigation equipment, chemical applicators, power sprayers, greens and fairway maintenance equipment, oxy-acetylene torches, arc welders and tractors.

III. **SPECIAL NOTE**: National Postsecondary Agricultural Student Organization is the appropriate vocational student organization for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizatins, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Planned and supervised occupational activities may be provided through directed laboratory experience, practicum or cooperative experience. Whenever the cooperative method of instruction is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks which are relevant to the occupation which the student has chosen as a career goal. The student must receive compensation for work performed.

The typical length of this program for the average achieving student is an associate degree. The standard credit hour length for this program is 69 hours.

IV. **INTENDED OUTCOMES**: After successfully completing this program, the student will be able to:

01.0 Supervise and manage the operation, maintenance and repair of golf course equipment.
02.0 Schedule irrigation and manage the design, installation and maintenance of golf course irrigation systems.
03.0 Prescribe, supervise and manage the application of agricultural chemicals for the prevention and control of pests.
04.0 Prescribe, supervise and manage the fertilization of turf and landscape.
05.0 Train and supervise employees in grooming and maintaining greens, tees, fairways, roughs and other areas.
06.0 Provide a safe environment for workers and patrons.
07.0 Keep and analyze maintenance, employee, equipment and inventory records.
08.0 Analyze and incorporate technical information into management practices
09.0 Observe local, state and federal laws and regulations.
10.0 Demonstrate leadership, communication, public relations, employability and human relations skills.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Golf Course Operations
Secondary Number:
Postsecondary Number: 0101.060701

01.0 SUPERVISE AND MANAGE THE OPERATION, MAINTENANCE AND REPAIR OF GOLF COURSE EQUIPMENT--The student will be able to:

01.01 Define the role of the golf course equipment mechanic in relation to the organization.
01.02 Determine the essential power, shop and hand tools required in a golf course mechanics shop.
01.03 Design a shop layout.
01.04 Compile a list of equipment required in the operation of an 18 hole golf course.
01.05 Demonstrate knowledge and use of golf course equipment.
01.06 Develop and supervise a system of preventive maintenance.
01.07 Sharpen and grind blades and cutting surfaces on all mowing equipment.
01.08 Trouble-shoot and repair golf course equipment.
01.09 Prepare surface and paint equipment.
01.10 Demonstrate gas and electric arc welding techniques on golf course equipment.
01.11 Compile, stock and manage a parts inventory.
01.12 Monitor and record the use of fuel, lubricants and consumable shop supplies.
01.13 Maintain a safe clean shop.
01.14 Maintain current catalogs for supplies and equipment.
01.15 Maintain tires and tire pressure on golf course equipment.
01.16 Train and supervise employees in the safe use of tools and equipment.

02.0 SCHEDULE IRRIGATION AND MANAGE THE DESIGN, INSTALLATION AND MAINTENANCE OF GOLF COURSE IRRIGATION SYSTEMS--The student will be able to:

02.01 Determine water requirements for a particular turf.
02.02 Analyze soil textures regarding their moisture holding capacities.
02.03 Analyze yearly, monthly and weekly rainfall amounts and distribution in various areas of Florida.
02.04 List the major water sources for irrigation purposes.
02.05 Operate and maintain hydraulically controlled, electrically controlled and thermo-hydraulically controlled irrigation valves.
02.06 Select and operate pumps used in sprinkler irrigation systems.
02.07 Illustrate the design, computations, pumping capacity and pipe sizing needed to irrigate a given operation.
02.08 Prepare a schedule for maintaining an irrigation system.
02.09 Schedule irrigation as required.
02.10 Manage drainage and run-off of excess rainfall.

03.0 PRESCRIBE, SUPERVISE AND MANAGE THE APPLICATION OF AGRICULTURAL CHEMICALS FOR THE PREVENTION AND CONTROL OF PESTS--The student will be able to:

03.01 Store and handle chemicals safely.
03.02 Recognize symptoms of agricultural chemical poisoning and apply first aid.
03.03 Dispose of chemical containers.
03.04 Read and interpret safety precautions provided on equipment and pesticide containers.
03.05 Instruct employees in the safe use of agricultural chemicals.
03.06 Select and check personal safety equipment.
03.07 Prepare proper proportions of chemicals and carrying agents.
03.08 Check application equipment for malfunction and wear.
03.09 Compute amounts of active ingredients of chemicals to be used.
03.10 Calibrate volume, pressure and output of equipment.
03.11 Weigh and measure chemicals.
03.12 Adjust height and width of equipment to achieve desired spray pattern.
03.13 Recognize symptoms of pesticide damage.
03.14 Identify fungi and bacteria.
03.15 Recognize symptoms of insects and nematodes.
03.16 Identify common insects, weeds, diseases and other pests common to golf courses.
03.17 Clean and store sprayers.
03.18 Develop a pest control management program.

04.0 PRESCRIBE, SUPERVISE AND MANAGE THE FERTILIZATION OF TURF AND LANDSCAPE--The student will be able to:

04.01 Take soil and leaf samples for chemical analysis.
04.02 Adjust pH level of soil.
04.03 Interpret soil and tissue chemical analysis results.
04.04 Apply fertilizer in liquid form.
04.05 Interpret labels on fertilizer containers.
04.06 Apply dry fertilizers.
04.07 Identify nutrient deficiency symptoms in turf and landscape plants.
04.08 Determine kind and type of fertilizer to apply to a given area.
04.09 Determine the nutrient requirements of various plants.
04.10 Determine amount of fertilizer to apply to a given area.
04.11 Analyze cost of various formulations and methods of application.
04.12 Recognize fertilizer injury to plant materials.

05.0 TRAIN AND SUPERVISE EMPLOYEES IN GROOMING AND MAINTAINING GREENS, TEES, FAIRWAYS, ROUGHS AND OTHER AREAS--The student will be able to:

05.01 Supervise the mowing of greens, collars, roughs, aprons, and fairways.
05.02 Determine the placement and location of cups and tees.
05.03 Supervise the repair of divots.
05.04 Determine conditions necessary for verticuting and aerifying turf.

05.05 Supervise the care and maintenance of sand traps.
05.06 Prune trees and shrubs.
05.07 Supervise the maintenance of water hazards.
05.08 Develop maintenance schedule for grooming golf courses.
05.09 Train and supervise employees in the care of golf courses.
05.10 Follow written and verbal instructions.

06.0 PROVIDE A SAFE ENVIRONMENT FOR WORKERS AND PATRONS--The student will be able to:

06.01 Provide instruction for the safe use of chemicals, tools and equipment.
06.02 Inspect tools and equipment for safe operation.
06.03 Apply emergency first aid.
06.04 Post safety hazards.
06.05 Monitor employees work habits.
06.06 Maintain safety awareness.

07.0 KEEP AND ANALYZE MAINTENANCE, EMPLOYEE, EQUIPMENT AND INVENTORY RECORDS--The student will be able to:

07.01 Maintain equipment use and maintenance records.
07.02 Keep and file personnel records and information.
07.03 Record and analyze time-on-task information.
07.04 Maintain pesticide use information.
07.05 Keep inventory records.
07.06 Prepare a written report or summary based on records.
07.07 Observe and make recommendations based on records.
07.08 Evaluate employees, equipment and practices based on records.
07.09 Develop annual budget for complete operation.
07.10 Keep and file guarantees, warrantees, service contracts and operators manuals.

08.0 ANALYZE AND INCORPORATE TECHNICAL INFORMATION INTO MANAGEMENT PRACTICES--The student will be able to:

08.01 Maintain a current file of technical information.
08.02 Update skills and knowledge through workshops and seminars.
08.03 Analyze data relative to operation.
08.04 Assess new materials, chemicals and procedures based on research or technical information.
08.05 Interpret technical information relative to operation.

09.0 OBSERVE LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS--The student will be able to:

09.01 Observe OSHA rules and regulations.
09.02 Observe EPA rules and regulations.
09.03 Secure and maintain permits, certificates and licenses appropriate to operation.
09.04 Observe stream and groundwater regulations.
09.05 Recognize responsibilities and liabilities of occupation or position.

09.06 Maintain a list of agencies responsible for regulating the industry.

10.0 DEMONSTRATE LEADERSHIP, COMMUNICATION, PUBLIC RELATIONS, EMPLOYABILITY AND HUMAN RELATIONS SKILLS--The student will be able to:

10.01 Conduct a job search.
10.02 Secure information about a job.
10.03 Identify documents that may be required when applying for a job.
10.04 Complete a job application form correctly.
10.05 Demonstrate competence in job interview techniques.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
10.07 Identify acceptable work habits.
10.08 Demonstrate knowledge of how to make job changes appropriately.
10.09 Demonstrate acceptable employee health habits.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Landscape Technology
Occupational Area:	Agriculture
	PSV
CIP Number	0101.060501
Grade Level	College Credits
Length	AS Degree
Certification	

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment as landscape contractors (182.167-014), landscape gardeners (408.161-010) landscapers (408.161-010), landscape designers, supervisors, park workers (406.134-014), gardeners, special effects (406.381-010), lawn service manager (15032000), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, instruction that prepares individuals to supervise, manage, and design exterior and interior landscapes. Subject matter also includes plant identification, disease and insect control, plant nutrition, irrigation, laws and regulations, and record keeping, as well as leadership, employability, communications, public and human relations skills.

II. **LABORATORY ACTIVITIES**: Agricultural shop and land laboratory activities are an integral part of this program including safe use of mechanics' hand tools, landscaping hand tools, hand and portable power carpentry tools, arc welders, oxy-acetylene torches, power sprayers, chemical applicators and tractors and landscaping equipment.

III. **SPECIAL NOTE**: National Postsecondary Agricultural Student Organization is the appropriate vocational student organization for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Planned and supervised occupational activities may be provided through directed laboratory experience, practicum or cooperative experience. Whenever the cooperative method of instruction is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflect equipment, skills and tasks which are relevant to the occupation which the student has chosen as a career goal. The student must receive compensation for work performed.

The typical length of this program for the average achieving student is an associate degree. The standard credit hour length for this program is 68 hours.

IV. **INTENDED OUTCOMES**: After successfully completing this program, the student will be able to:

01.0 Analyze and design the project (landscape and interiorscape).
02.0 Prepare estimate and establish contracts.
03.0 Analyze and organize the project.
04.0 Lay out and install landscape and interiorscape.
05.0 Plan, install, and service irrigation systems.
06.0 Plan and install a drainage system.
07.0 Maintain customer relations and observe follow-up procedures.
08.0 Maintain landscape plants.
09.0 Manage a pest control program.
10.0 Protect plants and equipment from adverse weather.
11.0 Select, operate, and maintain landscape tools and equipment.
12.0 Maintain and analyze records.
13.0 Demonstrate managerial and supervisory skills.
14.0 Demonstrate employability skills.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Landscape Technology
Secondary Number:
Postsecondary Number: 0101.060501

01.0 ANALYZE AND DESIGN THE PROJECT (LANDSCAPE AND INTERIOR-SCAPE)--The student will be able to:

01.01 Determine the purpose, problems, or desired effect of the project.
01.02 Analyze the environmental conditions of the landscape or interiorscape.
01.03 Determine site analysis problems.
01.04 Demonstrate working knowledge of computer-assisted drafting (CAD) system.
01.05 Design hardscape plan.
01.06 Design and select appropriate plant materials for desired effect and function.
01.07 Determine the method and form of presentation of the project.

02.0 PREPARE ESTIMATE AND ESTABLISH CONTRACTS--The student will be able to:

02.01 Develop a list of materials required for the project.
02.02 Determine equipment needs.
02.03 Estimate time and man hours.
02.04 Determine cost of materials, equipment, and labor.
02.05 Prepare a price for customer, based on specifications.
02.06 Establish terms of a contract.

03.0 ANALYZE AND ORGANIZE THE PROJECT--The student will be able to:

03.01 Interpret plans and specifications.
03.02 Identify safety requirements.
03.03 Organize site preparation.
03.04 Locate project materials.
03.05 Determine personnel needs.
03.06 Determine equipment needs.
03.07 Establish project schedule.

04.0 LAY OUT AND INSTALL LANDSCAPE AND INTERIORSCAPE--The student will be able to:

04.01 Locate existing utilities.
04.02 Rough grade the site.
04.03 Install large materials.
04.04 Install irrigation system.
04.05 Construct hardscape (walls, walks, patio, drives, etc.).
04.06 Lay out and install plants.
04.07 Prepare interiorscape.
04.08 Prepare final grade.
04.09 Install lawns.

04.10 Install mulch.
04.11 Perform final cleanup.

05.0 PLAN, INSTALL, AND SERVICE IRRIGATION SYSTEMS--The student will be able to:

05.01 Determine irrigation requirements.
05.02 Assess quality of irrigation water.
05.03 Plan an irrigation system.
05.04 Supervise the installation of irrigation equipment.
05.05 Service and maintain electric and engine-driven pumps.
05.06 Operate and service low-volume irrigation system.
05.07 Operate and service overhead irrigation system.
05.08 Operate and maintain automatic system.
05.09 Calculate cost efficiency of an irrigation system.

06.0 PLAN AND INSTALL A DRAINAGE SYSTEM--The student will be able to:

06.01 Determine the natural slope/grade of an area.
06.02 Determine the texture and percolation characteristics of the soil.
06.03 Identify techniques for constructing ditches and culverts.
06.04 Direct the movement of water away from structures and installations.
06.05 Plan the construction of an underground drainage system.
06.06 Estimate and order appropriate fill materials.
06.07 Establish proper elevations and grade a landscape site.
06.08 Read soils and contour maps.

07.0 MAINTAIN CUSTOMER RELATIONS AND OBSERVE FOLLOW-UP PROCEDURES--The student will be able to:

07.01 Conduct walk-through of project with client to assure satisfaction.
07.02 Identify current and future maintenance requirements.
07.03 Analyze project records for profitablility and employee performance.

08.0 MAINTAIN LANDSCAPE PLANTS--The student will be able to:

08.01 Determine water requirements and apply at proper rates.
08.02 Identify weeds and apply herbicides safely.
08.03 Determine fertilization requirements and apply at proper rates.
08.04 Identify plant pest problems and apply corrective measures.
08.05 Regulate the growth of landscape plants through chemical or mechanical means.
08.06 Maintain turf viability (mow at proper height and frequency,aerate, edge, clip, and remove trash).
08.07 Cultivate and mulch plants.
08.08 Brace and repair trees.

09.0 MANAGE A PEST CONTROL PROGRAM--The student will be able to:

09.01 Develop an integrated pest management program or schedule.

09.02 Train workers in the safe use of pesticides.
09.03 Obtain a restricted-use pesticide license.

10.0 PROTECT PLANTS AND EQUIPMENT FROM ADVERSE WEATHER--The student will be able to:

10.01 Monitor and interpret weather forecasts.
10.02 Supervise procedures for protecting plants and equipment from adverse weather.
10.03 Compare cost and efficiency of various methods of protecting plants and equipment from adverse weather.

11.0 SELECT, OPERATE, AND MAINTAIN LANDSCAPE TOOLS AND EQUIPMENT--The student will be able to:

11.01 Determine equipment needs for the company.
11.02 Select and operate equipment for the job.
11.03 Supervise the service and maintenance of power equipment.
11.04 Supervise the repair and maintenance of facilities.
11.05 Instruct and supervise employees in the safe use of tools and equipment.
11.06 Maintain an inventory of parts and supplies.

12.0 MAINTAIN AND ANALYZE RECORDS--The student will be able to:

12.01 Maintain fertilizer and pesticide application records.
12.02 Keep equipment maintenance and service records.
12.03 Maintain sales and production records.
12.04 Record labor and personnel information.
12.05 Keep inventory records.
12.06 Analyze cost and effectiveness of management practices.
12.07 Determine insurance needs.
12.08 Prepare an annual budget.
12.09 Prepare a five-year projection plan.
12.10 Maintain accounts-receivable and accounts-payable records.
12.11 Describe the use of computers in the landscape operation.

13.0 DEMONSTRATE MANAGERIAL AND SUPERVISORY SKILLS--The student will be able to:

13.01 Instruct employees in their tasks.
13.02 Prepare daily work plans.
13.03 Enforce safety regulations.
13.04 Evaluate performance of employees.
13.05 Develop an outline for a policy manual.
13.06 Organize and conduct employee training.
13.07 Conduct employee grievance procedures.
13.08 Prepare job descriptions.
13.09 Conduct job interviews.
13.10 Demonstrate effective communication skills.
13.11 Demonstrate computer literacy as related to landscape operation.

14.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about job.
14.03 Identify documents that may be required when applying for a job.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Ornamental Horticulture Technology
Occupational Area:	Agriculture
	PSV
CIP Number	0101.060300
Grade Level	College Credits
Length	AS Degree
Certification	

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment as production managers (180.117-014), nursery managers (180.167-042), production superintendents (699.130-010), landscape contractors (182.167-014), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, instruction that prepares individuals to supervise or manage the production and use of decorative plants, plant materials and associated services. Subject matter also includes plant nutrition, plant classification and identification, propagation, pest control, irrigation, marketing, equipment management, cultural and environmental management, business management, design, and employability and human relations skills.

II. **LABORATORY ACTIVITIES**: Laboratory and horticultural land laboratory activities are an integral part of this program and include the use of horticultural equipment, management and maintenance of growing structures, chemical application and landscape installation.

III. **SPECIAL NOTE**: National Postsecondary Agricultural Student Organization is the appropriate vocational student organization for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Planned and supervised occupational activities must be provided through directed laboratory experience, practicum or cooperative experience. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks which are relevant to the occupation which the student has chosen as a career goal. The student must receive compensation for work performed.

The typical length of this program for the average achieving student is an associate degree. The standard credit hour length for this program is 60 hours.

IV. **INTENDED OUTCOMES**: After successfully completing this program, the student will be able to:

01.0 Demonstrate an understanding of plant physiology and growth.
02.0 Classify ornamental flowers.
03.0 Prepare growing media and seedbeds.
04.0 Propagate ornamental plants.
05.0 Design, install, and service irrigation systems.
06.0 Determine drainage system needs and design a drainage system.
07.0 Select, operate, and maintain tools and equipment.
08.0 Grow ornamental plants.
09.0 Fertilize ornamental plants.
10.0 Manage a pest-control program.
11.0 Prune and shape ornamental plants.
12.0 Protect plants and equipment from adverse weather.
13.0 Harvest, process, and ship ornamental plants.
14.0 Market ornamental plants.
15.0 Maintain and analyze records.
16.0 Demonstrate managerial and supervisory skills.
17.0 Design ornamental horticulture facilities.
18.0 Demonstrate employability skills.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Ornamental Horticulture Technology
Secondary Number:
Postsecondary Number: 0101.060300

01.0 DEMONSTRATE AN UNDERSTANDING OF PLANT PHYSIOLOGY AND GROWTH--The student will be able to:

01.01 Describe the process of photosynthesis (C-3 and C-4 pathways).
01.02 Identify and describe the functions of all parts of the plant.
01.03 Describe an asexual reproduction process.
01.04 Explain the differences between angiosperms and gymnosperms.
01.05 Identify the differences between woody and herbaceous plants.

02.0 CLASSIFY ORNAMENTAL FLOWERS--The student will be able to:

02.01 Identify and group shade and flowering trees.
02.02 Identify and group fruit trees and plants.
02.03 Identify and group annuals, vegetables, and herbs.
02.04 Identify and group woody ornamentals, vines, and ground covers.
02.05 Identify and group tropical foliage plants.
02.06 Identify and group turf and ornamental grasses.

03.0 PREPARE GROWING MEDIA AND SEEDBEDS--The student will be able to:

03.01 Identify media materials.
03.02 Mix rooting and growing media according to plant requirements.
03.03 Sterilize rooting, potting, and growing media.
03.04 Collect and test a soil sample from field and potting media.
03.05 Adjust pH and nutritional levels of media.
03.06 Prepare planting beds and sites.
03.07 Fill and level benches and pots with media.
03.08 Demonstrate sanitation practices when handling and storing plant media materials.

04.0 PROPAGATE ORNAMENTAL PLANTS--The student will be able to:

04.01 Collect propagation materials at proper time (seeds, cuttings, scions, bulbs, etc.)
04.02 Demonstrate propagation by grafting, budding, layering, separating, dividing, cutting, and tissue culturing.
04.03 Prepare flats and a seedbed and plant seeds.
04.04 Prepare a rooting bed.
04.05 Prepare propagation materials (seeds, cuttings, scions, etc.).
04.06 Apply growth stimulants to propagation materials.
04.07 Control propagation facility environment (moisture, temperature, light).
04.08 Transplant rooted propagation materials including tissue culture transplants.
04.09 Describe advanced propagation techniques (tissue culture, pre-germination, seed irradiation, tree cuttings).

04.10 Demonstrate sanitation and safety practices when propagating.

05.0 DESIGN, INSTALL, AND SERVICE IRRIGATION SYSTEMS--The student will be able to:

05.01 Determine irrigation requirements.
05.02 Assess quality of irrigation water.
05.03 Design and set up an irrigation system for propagation area, greenhouse or enclosed structure, shade house, retail display area, and field-growing area.
05.04 Maintain electric and engine-driven pumps.
05.05 Operate and service various types of irrigation systems.
05.06 Calculate cost efficiency of irrigation system.

06.0 DETERMINE DRAINAGE SYSTEM NEEDS AND DESIGN A DRAINAGE SYSTEM--The student will be able to:

06.01 Determine the natural slope/grade of an area.
06.02 Determine the texture and percolation characteristics of the soil.
06.03 Identify techniques for constructing ditches and culverts.
06.04 Direct the movement of water away from structures and installations.
06.05 Design an underground drainage system.

07.0 SELECT, OPERATE, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

07.01 Determine equipment needs for the company.
07.02 Select and operate equipment for the job.
07.03 Supervise the service and maintenance of power equipment.
07.04 Supervise the repair and maintenance of facilities.
07.05 Instruct and supervise employees in the safe use of tools and equipment.
07.06 Maintain an inventory of parts and supplies.

08.0 GROW ORNAMENTAL PLANTS--The student will be able to:

08.01 Prepare media for containers.
08.02 Prepare field site for transplants.
08.03 Select plant containers.
08.04 Determine plant spacing in the field and on container beds.
08.05 Transplant propagated materials to various containers and to the field.
08.06 Determine and provide light requirements of various plant types.
08.07 Determine water requirements and apply water at proper rates.
08.08 Identify weeds and apply herbicides.
08.09 Determine fertilization requirements.
08.10 Identify insect and insect-like disease problems and apply pesticides.
08.11 Demonstrate safety practices when applying pesticides.

09.0 FERTILIZE ORNAMENTAL PLANTS--The student will be able to:

09.01 Evaluate influences of nutrients on plant growth.
09.02 Collect soil and leaf tissue samples for analysis.
09.03 Interpret and evaluate the results of soil and leaf tissue analysis.
09.04 Apply fertilizers, using appropriate methods (dry, liquid, slow-release, injection, etc.).
09.05 Demonstrate proper handling and storage of fertilizers, observing safety precautions.

10.0 MANAGE A PEST-CONTROL PROGRAM--The student will be able to:

10.01 Develop an integrated pest management program or schedule.
10.02 Train employees in the safe use of pesticides.
10.03 Obtain a restricted-use pesticide license.

11.0 PRUNE AND SHAPE ORNAMENTAL PLANTS--The student will be able to:

11.01 Train employees in pruning techniques.
11.02 Develop a pruning program and time schedule.
11.03 Identify and use tools for pruning.
11.04 Prune plants to achieve desired growth.
11.05 Prune plants with unique cultural requirements (roses, fruit trees, etc.)
11.06 Prune specialty items (topiary, espalier, bonsai, etc.).
11.07 Select and use chemical growth regulators.
11.08 Root-prune ornamental plants and trees.
11.09 Demonstrate sanitation and safety practices when pruning.

12.0 PROTECT PLANTS AND EQUIPMENT FROM ADVERSE WEATHER--The student will be able to:

12.01 Monitor and interpret weather forecasts.
12.02 Supervise procedures for protecting plants and equipment from adverse weather.
12.03 Compare cost and efficiency of various methods of protecting plants and equipment from adverse weather.
12.04 List ornamental plants according to environmental tolerances (light, temperature, moisture, wind, salt, etc.).

13.0 HARVEST, PROCESS, AND SHIP ORNAMENTAL PLANTS--The student will be able to:

13.01 Grade and harvest field-grown plants (ball, burlap, bare-root, "grow-bags").
13.02 Identify mechanical techniques for harvesting field-grown plants (tree spade and mechanical digger).
13.03 Select, grade, and assemble container-grown plants.
13.04 Prepare for shipment, loading, and transporting harvested plant materials.
13.05 Use proper methods for preserving plant viability.
13.06 Comply with regulations regarding the inspection and movement of plant materials.

13.07 Demonstrate safety practices when harvesting, processing, and shipping nursery stock.

14.0 MARKET ORNAMENTAL PLANTS--The student will be able to:

14.01 Identify, inventory, and label marketable plants.
14.02 Identify market segments (commercial, residential, wholesale, retail, etc.).
14.03 Identify methods of marketing (advertising, public relations, sales peronnel, trade shows, etc.).
14.04 Develop a marketing program (budget, displays, sales aids, price lists, etc.).
14.05 Develop sales training program (product knowledge, customer relations, sales techniques, resource materials, etc.)
14.06 Develop an annual sales calendar (seasonal sales, special promotion, etc.).

15.0 MAINTAIN AND ANALYZE RECORDS--The student will be able to:

15.01 Maintain fertilizer and pesticide application records.
15.02 Keep equipment maintenance and service records.
15.03 Maintain sales and production records.
15.04 Record labor and personnel information.
15.05 Keep inventory records.
15.06 Analyze cost and effectiveness of management practices.
15.07 Determine plant production costs.
15.08 Determine insurance needs.
15.09 Prepare an annual budget.
15.10 Prepare a five-year projection plan.
15.11 Maintain accounts-receivable and accounts-payable records.
15.12 Describe the use of computers in the ornamental horticulture operation.

16.0 DEMONSTRATE MANAGERIAL AND SUPERVISORY SKILLS--The student will be able to:

16.01 Instruct employees in their tasks.
16.02 Prepare daily work plans.
16.03 Enforce safety regulations.
16.04 Evaluate performance of employees.
16.05 Develop an outline for a policy manual.
16.06 Organize and conduct employee training.
16.07 Conduct employee grievance procedures.
16.08 Prepare job descriptions.
16.09 Conduct job interviews.
16.10 Demonstrate effective communication skills.
16.11 Demonstrate computer literacy as related to the ornamental horticulture operation.

17.0 DESIGN ORNAMENTAL HORTICULTURE FACILITIES--The student will be able to:

17.01 Design a facility for propagating ornamental plants.
17.02 Design a bedding-plants growing facility.
17.03 Design a container growing facility.

17.04 Design a field growing facility.
17.05 Design a tropical foliage growing facility.
17.06 Design a retail facility.

18.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

18.01 Conduct a job search.
18.02 Secure information about a job.
18.03 Identify documents that may be required when applying for a job.
18.04 Complete a job application form correctly.
18.05 Demonstrate competency in job interview techniques.
18.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other person.
18.07 Identify acceptable work habits.
18.08 Demonstrate knowledge of how to make job changes.
18.09 Demonstrate acceptable employee health habits.

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Park Management
Occupational Area:	Agriculture
	PSV
CIP Number	0131.030100
Grade Level	College Credits
Length	AS Degree
Certification	

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment as supervisors, parks and recreation; superintendents, parks; park managers; guides, parks and wildlife refuge; or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, instruction that prepares individuals to plan and manage recreational facilities and programs for public or private agencies. Subject matter also include record keeping, laws and regulations, safety, protection of facilities and wildlife, maintenance, as well as leadership, communication, employability, human and public relations skills.

II. **LABORATORY ACTIVITIES**: Shop and park laboratory activities are an integral part of this program including the safe use of mechanics' hand tools, field hand tools, hand and portable power carpentry tools, tractors and field equipment and forest fire control tools.

III. **SPECIAL NOTE**: National Postsecondary Agricultural Student Organization is the appropriate vocational student organization for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be and integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Planned and supervised occupational activities may be provided through directed laboratory experience, practicum or cooperative experience. Whenever the cooperative method of instruction is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks which are relevant to the occupation which the student has chosen as a career goal. The student must receive compensation for work performed.

The typical length of this program for the average achieving student is an associate degree.

IV. **INTENDED OUTCOMES**: After successfully completing this program, the student will be able to:

01.0 Keep and analyze inventory, personnel, maintenance and financial records.
02.0 Identify, interpret and apply laws and regulations and policies to the operation.
03.0 Demonstrate leadership, employability, communication, human and public relations skills.
04.0 Develop a plan to manage the natural resources, wildlife and land resources of a park.
05.0 Manage and supervise the protection of park resources and visitors.
06.0 Identify and manage park flora and fauna.
07.0 Manage, construct and maintain facilities and grounds.
08.0 Interpret and incorporate technical information into park management practices.
09.0 Manage visitor services.
10.0 Operate and maintain tools and equipment.

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Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Park Management
Secondary Number:
Postsecondary Number: 0131.010100

01.0 KEEP AND ANALYZE INVENTORY, PERSONNEL, MAINTENANCE AND FINANCIAL RECORDS--The student will be able:

01.01 Complete weekly receipts.
01.02 Complete invoices.
01.03 Requisition materials supplies and services.
01.04 Keep inventory records.
01.05 Keep and maintain equipment and machinery service and maintenance records.
01.06 Prepare work schedules.
01.07 Interpret contracts.
01.08 Contribute to annual park management update and criteria.
01.09 Prepare a park budget.
01.10 Audit park receipts.
01.11 Analyze park use patterns.
01.12 Maintain personnel records.

02.0 IDENTIFY, INTERPRET AND APPLY LAWS AND REGULATIONS AND POLICIES TO THE OPERATION--The student will be able to:

02.01 Explain employee disciplinary procedures and processes.
02.02 Interpret and explain game and wildlife laws.
02.03 Interpret and explain stream, lake, pond and groundwater laws.
02.04 Patrol park areas.
02.05 Enforce park regulations.
02.06 Report violations to appropriate authority.
02.07 Observe EPA regulations.
02.08 Identify agencies responsible for regulating parks.
02.09 Secure and maintain permits, certificates and licenses.

03.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATION, HUMAN AND PUBLIC RELATIONS SKILLS--The student will be able to:

03.01 Conduct a job search.
03.02 Secure information about a job.
03.03 Identify documents that may be required when applying for a job.
03.04 Complete a job application form correctly.
03.05 Demonstrate competence in job interview techniques.
03.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
03.07 Identify acceptable work habits.
03.08 Demonstrate knowledge of how to make job changes appropriately.
03.09 Demonstrate acceptable employee health habits.

04.0 DEVELOP A PLAN TO MANAGE THE NATURAL RESOURCES, WILDLIFE AND LAND RESOURCES OF A PARK--The student will be able to:

04.01 Read and interpret legal descriptions.
04.02 Identify and classify soil types.
04.03 Determine the use and capability of land resources.
04.04 Assist in the development of land, wildlife and water resource conservation plans for park areas.
04.05 Read and interpret maps, charts and aerial photographs.

05.0 MANAGE AND SUPERVISE THE PROTECTION OF PARK RESOURCES AND VISITORS--The student will be able to:

05.01 List the major liabilities and responsibilities of management for the protection of park resources and visitors.
05.02 Post and maintain park directions and warnings.
05.03 Post park rules and regulations.
05.04 Administer emergency first aid.
05.05 Recognize need for medical assistance.
05.06 Develop plans to protect visitors from dangerous animals and other hazards.
05.07 Develop plans to protect animals and plants and other resources from visitors.
05.08 Monitor and supervise camping and swimming areas.
05.09 Operate and maintain fire fighting equipment and tools.
05.10 Construct and maintain wildfire protection lanes.
05.11 Supervise and maintain park sanitation.

06.0 IDENTIFY AND MANAGE PARK FLORA AND FAUNA--The student will be able to:

06.01 List plant communities and dominant species within a selected park.
06.02 Identify native plant species of a selected area or park.
06.03 Identify plant species toxic to animals and humans.
06.04 Apply pesticides and herbicides according to established park policy.
06.05 Identify wildlife species in a selected area or park.
06.06 List endangered or exotic species of plant and animal life in a selected area or park.
06.07 Develop a plan to manage wildlife in a park.
06.08 Describe interactions between living and non-living components of an ecological system.
06.09 Develop a plan to reestablish native plant and animal life in a selected area or park.
06.10 Plan and monitor an ecological burn.

07.0 MANAGE, CONSTRUCT AND MAINTAIN FACILITIES AND GROUNDS--The student will be able to:

07.01 Develop a facility and grounds maintenance schedule.
07.02 Monitor and report facility and grounds maintenance needs.
07.03 Determine need for private contractors.
07.04 Estimate cost of services.
07.05 Maintain and repair water and sewer systems.

07.06 Maintain and repair structures and conveniences.
07.07 Maintain grounds and recreation areas.
07.08 Plan and construct facilities.
07.09 Make electrical repairs.
07.10 Form and pour concrete.
07.11 Maintain roads, culverts and drainage ditches.
07.12 Observe safety precautions.

08.0 INTERPRET AND INCORPORATE TECHNICAL INFORMATION INTO PARK MANAGEMENT PRACTICES--The student will be able to:

08.01 Maintain a current file of technical information.
08.02 Update skills and knowledge through workshops and seminars.
08.03 Analyze data relative to the operation.
08.04 Assess new practices, equipment and materials based on research or technical information.
08.05 Interpret technical information relative to occupation.

09.0 MANAGE VISITOR SERVICES--The student will be able to:

09.01 Develop and conduct a visitors program and tour.
09.02 Register visitors.
09.03 Schedule events and programs.
09.04 Schedule facilities use.
09.05 Give instructions and directions.
09.06 Manage the flow of vehicular or pedestrian traffic.
09.07 Manage visitor requests and complaints.
09.08 Manage youth groups and events.
09.09 Take reservations.

10.0 OPERATE AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

10.01 Operate and maintain tractor and equipment.
10.02 Prepare a schedule for equipment preventative maintenance.
10.03 Write a set of equipment standards for use in bid specifications.
10.04 Plan and maintain a shop and tool storage facility.
10.05 Control and secure tool and equipment inventory.
10.06 Store flamable and hazardous materials.
10.07 Monitor equipment for safe efficient operation.
10.08 Supervise and train employees in the safe use of tools and equipment.
10.09 Maintain and use shields, guards and other safety devices on tools and equipment.
10.10 Observe OSHA standards for safety.
10.11 Complete and submit accident or injury reports.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title: Pest Control Technology
Occupational Area: Agriculture

	PSV
CIP Number	0102.040800
Grade Level	College Credits
Length	AS Degree
Certification	

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment as pest controllers and assistants (67008407), inspectors, agricultural commodities (168.287-010), sales representatives, herbicide service (251.357-026), sales agents, pest control service (251.357-018), field inspectors, disease and insect control (408.137-010), supervisors, spray, lawn and tree service (408.131-010), supervisor, insect and disease inspection (408.137-010) or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, instruction that prepares individuals to supervise and manage the sales and application of agricultural chemicals and pesticides. Subject matter includes business management sales, equipment use management, safety, pest identification, recordkeeping, leadership, employability skills, communications and human and public relations.

II. **LABORATORY ACTIVITIES**: Land, shop and pest control laboratory activities are an integral part of this program including the safe use of hand and power shop tools, hand pesticide and chemical applicators, tractors and power operated chemical and pesticide applicators and safety equipment.

III. **SPECIAL NOTE**: National Postsecondary Agricultural Student Organization is the appropriate vocational student organization for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Planned and supervised occupational activities may be provided through directed laboratory experience, practicum or cooperative experience. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks which are relevant to the occupation which the student has chosen as a career goal. The student must receive compensation for work performed.

The typical length of this program for the average achieving student is an associate degree. The standard credit hour length for this program is 62 hours.

IV. **INTENDED OUTCOMES**: After successfully completing this program, the student will be able to:

01.0 Manage and supervise the application of pesticides and agricultural chemicals.
02.0 Supervise and train personnel in the safe and efficient use of pesticides and agricultural chemicals.
03.0 List and interpret laws and regulations relative to the safe application of pest control materials.
04.0 Manage the maintenance of equipment used to apply pest control materials.
05.0 Qualify for appropriate certification to apply pest control materials.
06.0 Keep accurate records required by law and for business management purposes.
07.0 Classify and identify pests and the appropriate chemicals used to control them.
08.0 Apply business practices.
09.0 Market and merchandise goods and services.
10.0 Demonstrate leadership, communication, employability, human and public relations skills.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Pest Control Technology
Secondary Number:
Postsecondary Number: 0102.040800

01.0 MANAGE AND SUPERVISE THE APPLICATION OF PESTICIDES AND AGRICULTURAL CHEMICALS--The student will be able to:

01.01 Recognize pesticide and chemical poisoning symptoms.
01.02 Read and interpret packaging labels and guidelines for safety.
01.03 Read and interpret packaging labels for application rates and instructions.
01.04 Recommend kinds of pesticides and agricultural chemicals to be used in specific situations.
01.05 Use protective clothing and equipment when handling agricultural chemicals.
01.06 Recognize symptoms of pesticide, chemical and residue damage.
01.07 Calculate coverage of chemical.
01.08 Assess compatibility of selected chemicals.
01.09 Determine rate and volume of chemical to be applied.
01.10 Select time of chemical application.
01.11 Select and match nozzles for equipment type, chemical used and pattern of application.
01.12 Safely store chemicals.
01.13 Mix chemicals and carrying agents.
01.14 Apply granular or dry chemical materials.
01.15 Apply liquid materials.
01.16 Adjust ground speed of chemical application equipment.
01.17 Dispose of used chemical containers.

02.0 SUPERVISE AND TRAIN PERSONNEL IN THE SAFE AND EFFICIENT USE OF PESTICIDES AND AGRICULTURAL CHEMICALS--The student will be able to:

02.01 Develop a labor supply plan.
02.02 Hire and dismiss employees.
02.03 Establish and record pay scale and benefits for workers.
02.04 Instruct employees in the safe and efficient use of chemicals and equipment.
02.05 Observe and evaluate employees.
02.06 Maintain safety standards in the application of agricultural chemicals.
02.07 Observe rights and needs of employees.
02.08 Post appropriate health and safety announcements.
02.09 Give and take verbal and written instructions.
02.10 Maintain a safe working environment.

03.0 LIST AND INTERPRET LAWS AND REGULATIONS RELATIVE TO THE SAFE APPLICATION OF PEST CONTROL MATERIALS--The student will be able to:

03.01 Observe local, state and federal pesticide and agricultural chemical regulations.

03.02 Observe EPA regulations.
03.03 List agencies responsible for the regulation of the pest control and chemical application industry.
03.04 Attend workshops and seminars to upgrade skills and knowledge.
03.05 Maintain a file for technical information, periodicals and other information.
03.06 Determine sources of up-to-date information and services.
03.07 List societies, organizations and associations relative to the occupation or profession.

04.0 MANAGE THE MAINTENANCE OF EQUIPMENT USED TO APPLY PEST CONTROL MATERIALS--The student will be able to:

04.01 Inspect safety equipment for cleanliness, effectiveness and proper fit.
04.02 Inspect equipment for leaks, clogs, and other malfunctions, and determine appropriateness of equipment for a specific job.
04.03 Adjust pressure and spray patterns.
04.04 Adjust equipment height and width.
04.05 Adjust mixing apparatus.
04.06 Repair or replace hoses, nozzles and cut-off valves.
04.07 Prepare equipment for storage.
04.08 Order replacement parts and supplies.
04.09 Supervise and/or perform maintenance and repairs.
04.10 Lubricate equipment.
04.11 Follow operators manual.
04.12 Repair and/or maintain dusters.
04.13 Repair and/or maintain fumigators.
04.14 Supervise and/or maintain vehicle maintenance records.
04.15 Maintain and use shop equipment and tools.
04.16 Clean and flush chemical application equipment.
04.17 Describe compatibility of equipment with chemicals used.

05.0 QUALIFY FOR APPROPRIATE CERTIFICATION TO APPLY PEST CONTROL MATERIALS--The student will be able to:

05.01 Interpret certification and licensing requirements.
05.02 Identify qualification needed for various certificates or licensure.
05.03 Apply for license or certificate.
05.04 Maintain license or certificate.

06.0 KEEP ACCURATE RECORDS REQUIRED BY LAW AND FOR BUSINESS MANAGEMENT PURPOSES--The student will be able to:

06.01 Maintain personnel records.
06.02 Maintain health and accident records.
06.03 Maintain equipment maintenance records.
06.04 Keep and maintain complete pesticide application records.
06.05 Keep records of employee training and licensure.
06.06 File required local, state and federal reports.
06.07 Maintain inventory control of pesticides and chemicals.

07.0 CLASSIFY AND IDENTIFY PESTS AND APPROPRIATE CHEMICALS USED TO CONTROL THEM--The student will be able to:

07.01 Identify fungi and bacteria and their symptoms.
07.02 Recognize symptoms of insects and nematodes.
07.03 Classify feeding habits and life cycles of insects.
07.04 Describe life cycles of bacteria and fungi.
07.05 Consider the pest, host being attacked and chemical when recommending chemical control measures.
07.06 Assess environmental impact when recommending chemical control measures.
07.07 Identify insect, weed and other pests.

08.0 APPLY BUSINESS PRACTICES--The student will be able to:

08.01 Maintain ledger of accounts.
08.02 Determine cost efficiency of operation.
08.03 Prepare a tax return.
08.04 Prepare a budget.
08.05 Determine credit, cash flow and investment returns.
08.06 Review sources and kinds of insurance required.
08.07 Review bonding needs and procedures.
08.08 List major sources of business credit and loans.

09.0 MARKET AND MERCHANDISE GOODS AND SERVICES--The student will be able to:

09.01 Display goods.
09.02 Manage sales.
09.03 Open and close office daily.
09.04 Update price list for goods and services.
09.05 Prepare advertising.
09.06 Handle customer complaints and questions.
09.07 Take order for goods and services by telephone.
09.08 Inspect and follow-up quality of services performed for customer.
09.09 Advise customer in the selection of goods or services.

10.0 DEMONSTRATE LEADERSHIP, COMMUNICATION, EMPLOYABILITY, HUMAN AND PUBLIC RELATIONS SKILLS--The student will be able to:

10.01 Conduct a job search.
10.02 Secure information about a job.
10.03 Identify documents that may be required when applying for a job.
10.04 Complete a job application form correctly.
10.05 Demonstrate competence in job interview techniques.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
10.07 Identify acceptable work habits.
10.08 Demonstrate knowledge of how to make job changes appropriately.
10.09 Demonstrate acceptable employee health habits.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Turf Equipment Management
Occupational Area:	Agriculture
	PSVC
CIP Number	0101.029900
Grade Level	College Credits
Length	One Year Certificate
Certification	

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment as first line supervisors and manager/supervisors - mechanics, installers, and repairers (81002540), turf equipment service managers or to provide supplemental professional training for persons previously or currently employed in this occupation.

The content includes, but is not limited to, instruction that prepares individuals to manage and maintain turf care equipment and to manage a shop facility. Instruction includes: hand tools, gasoline and diesel mechanics, paints and painting, sharpening and grinding, welding, hydraulics, electrical systems, training on specialized turf care equipment, record keeping, inventory control, safety, laws and regulations, public relations, human relations, shop management, professionalism, employability skills, communications skills, and management skills.

II. **LABORATORY ACTIVITIES**: Shop and field laboratory activities are an integral part of this program and provide instruction in the use of hand tools and special tools, the proper operation and maintenance procedures on turf care equipment, oxy-acetylene and electric arc welding, painting, sharpening and grinding reel and rotary mower blades, engine repair, electrical, hydraulic, mechanical, and structural repair of turf care equipment, and the assembly of new turf care equipment.

III. **SPECIAL NOTE**: The National Postsecondary Agricultural Student Organization and the Professional Turf Equipment Service Technology Association (T.E.S.T.A.) are the appropriate organizations for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Planned and supervised occupational activities may be provided through directed laboratory experience. Whenever the cooperative method of instruction is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks which are relevant to the occupation which the student has chosen as a career goal. The student must receive compensation for work performed.

Graduates from this college credit certificate program will have sufficient equipment and shop management theory and practice to articulate with A.S. degree programs in Golf Course Operations.

The typical length of this program for the average achieving student is a one-year college credit certificate program.

IV. **INTENDED OUTCOMES**: After successfully completing this program, the student will be able to:

01.0 Disassemble, reassemble, adjust, repair, and diagnose the problems related to two and four-cycle engines.
02.0 Service electrical systems, fuels and lubricating systems, cooling systems, power train/hydraulic drives, and controls on turf equipment.
03.0 Adjust, sharpen, grind, and rebuild reel and rotary mowing units.
04.0 Paint and protect turf equipment using appropriate equipment, materials, and techniques.
05.0 Use shop tools and equipment, and organize a shop following appropriate safety, management, and inventory techniques.
06.0 Order and stock parts and keep shop records.
07.0 Perform basic welding tasks using both gas and arc welding techniques.
08.0 Identify and safely operate turf care equipment.
09.0 Develop appropriate grooming habits.
10.0 Demonstrate employability skills.
11.0 Identify the various professional organizations and publications that pertain to the turf management industry.
12.0 Design a functional golf course maintenance facility and select appropriate maintenance equipment.
13.0 Develop a preventive maintenance program for turf care equipment.
14.0 Develop human relations skills.
15.0 Perform decision making activities.
16.0 Identify and demonstrate appropriate management activities.
17.0 Develop a management and training program for new employees.
18.0 Develop a plan for the functional use of turf equipment management personnel.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Turf Equipment Management
Secondary Number:
Postsecondary Number: 0101.029900

01.0 DISASSEMBLE, REASSEMBLE, ADJUST, REPAIR, AND DIAGNOSE THE PROBLEMS RELATED TO TWO-CYCLE AND FOUR-CYCLE ENGINES--The student will be able to:

01.01 Evaluate horsepower and torque.
01.02 Disassemble and reassemble a two-cycle and four-cycle engine.
01.03 Identify crankcase and cylinder assembly.
01.04 Identify and be able to assemble valves, piston assembly, crankshaft, cooling system, and air filters.
01.05 Identify and assemble parts of the carburetor assembly.
01.06 Identify and assemble the ignition system, governor, alternator, and starter system.
01.07 Identify types of batteries.
01.08 Follow safety rules and precautions when dealing with engines.

02.0 SERVICE ELECTRICAL SYSTEMS, FUEL AND LUBRICATING SYSTEMS, POWER TRAIN/HYDRAULIC DRIVES, AND CONTROLS ON TURF EQUIPMENT--The student will be able to:

02.01 Identify turf equipment electrical systems.
02.02 Service hydraulic systems on a variety of turf equipment.
02.03 Service turf equipment power train systems.
02.04 Identify and service various lubricating systems and understand types of fuels and lubricants.
02.05 Operate and repair the various mechanical and hydraulic controls on turf equipment.
02.06 Repair the governor, ignition, alternator, and starter system on various pieces of turf equipment.

03.0 ADJUST, SHARPEN, GRIND, AND REBUILD REEL AND ROTARY MOWING UNITS--The student will be able to:

03.01 Repair and sharpen various types of reel mowers.
03.02 Grind reel bedknives with various bedknife grinders.
03.03 Lap reel mower blades.
03.04 Follow safety procedures when using reel and bedknife grinders.
03.05 Adjust reel mowers to produce proper cutting heights.
03.06 Sharpen and balance rotary mower blades.
03.07 Remove and replace rotary mower blades.

04.0 PAINT AND PROTECT TURF EQUIPMENT USING APPROPRIATE EQUIPMENT, MATERIALS, AND TECHNIQUES--The student will be able to:

04.01 List and describe the major kinds of paints and other metal protectants.

04.02 Select the proper surface protectants for different metals common to turf equipment.
04.03 Operate a steam cleaner safely.
04.04 Clean and prepare turf equipment for painting.
04.05 Operate a pressure spray gun safely.
04.06 Use paint thinners, preservatives, and other additives.
04.07 Prepare and paint a given piece of turf equipment.
04.08 Prepare and paint metal and wood surfaces.
04.09 Organize a paint center following proper safety requirements for a turf maintenance facility.

05.0 USE SHOP TOOLS AND EQUIPMENT AND ORGANIZE A SHOP FOLLOWING APPROPRIATE SAFETY, MANAGEMENT AND INVENTORY TECHNIQUES--The student will be able to:

05.01 Follow basic OSHA safety regulations and shop fire prevention techniques.
05.02 Perform basic first aid procedures.
05.03 Establish a file system for shop records.
05.04 Identify and use shop hand tools and equipment that relate to turf equipment maintenance.
05.05 Select the appropriate fasteners, bearings, seals, belts, chains fuels, and lubricants for various turf equipment.
05.06 Establish and maintain appropriate shop space for specific shop tasks.
05.07 Establish an appropriate equipment inventory system.

06.0 ORDER AND STOCK PARTS AND KEEP SHOP RECORDS--The student will be able to:

06.01 Use the various equipment manuals to identify parts and service procedures.
06.02 Order parts properly.
06.03 Establish a system for stocking appropriate turf equipment parts.
06.04 Gather the appropriate forms for establishing a recordkeeping system.

07.0 PERFORM BASIC WELDING TASKS USING BOTH GAS AND ARC WELDING TECHNIQUES--The student will be able to:

07.01 Follow welding symbols, and safety practices.
07.02 Connect and operate oxy-acetylene welding equipment.
07.03 Run beads and weld various types of joints.
07.04 Braze and solder metal.
07.05 Cut metal with and oxy-acetylene torch.
07.06 Select appropriate welding rods.
07.07 Set up an electrical arc welding machine.
07.08 Arc weld various types of joints.

08.0 IDENTIFY AND SAFELY OPERATE TURF CARE EQUIPMENT--The student will be able to:

08.01 Identify the appropriate use for commonly used turf care equipment.
08.02 Identify the operation safety procedures for commonly used turf equipment.
08.03 Operate properly all commonly used turf care equipment.

09.0 DEVELOP APPROPRIATE GROOMING HABITS--The student will be able to:

09.01 Identify appropriate attire and grooming to maintain a functional and professional atmosphere in the equipment maintenance facility.

10.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

10.01 Conduct a job search.
10.02 Secure information about a job.
10.03 Identify documents which may be required when applying for a job interview.
10.04 Complete a job application correctly.
10.05 Demonstrate competence in a job interview.
10.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
10.07 Identify acceptable work habits.
10.08 Demonstrate knowledge or how to make job changes appropriately.
10.09 Demonstrate acceptable employee health habits.

11.0 IDENTIFY THE VARIOUS PROFESSIONAL ORGANIZATIONS AND PUBLICATIONS THAT PERTAIN TO THE TURF MANAGEMENT INDUSTRY--The student will be able to:

11.01 Identify major points in the history of the golf course/turf industry.
11.02 Identify and understand various professional turf publications.
11.03 Identify and understand the basic role of professional turf organizations.
11.04 Identify the basics of the seed production and sod production industries.
11.05 Identify the various classes of golf courses and turf maintenance organizations.

12.0 DESIGN A FUNCTIONAL GOLF COURSE MAINTENANCE FACILITY AND SELECT APPROPRIATE MAINTENANCE EQUIPMENT--The student will be able to:

12.01 Evaluate the organization and management styles utilized by various golf courses.
12.02 Classify, by use, the various equipment used on a typical 18-hole golf course.
12.03 List the equipment needed to properly maintain an 18-hole golf course.
12.04 Design and organize a golf course maintenance complex.
12.05 Develop an equipment budget for an 18-hole golf course.

13.0 DEVELOP PREVENTIVE MAINTENANCE PROGRAMS FOR TURF CARE EQUIPMENT--The student will be able to:

13.01 Use equipment manufacturers' manuals to implement proper service procedures.
13.02 Develop a recordkeeping system to record equipment use.
13.03 Develop a recordkeeping system to record service work performed on equipment.

14.0 DEVELOP HUMAN RELATIONS SKILLS--The student will be able to:

14.01 Demonstrate appropriate work habits.
14.02 Identify traits that promote good human relations and increase job performance.
14.03 Develop an understanding of the role of the golf course superintendent and turf equipment service manager in the overall successful operations of the golf course.

15.0 PERFORM DECISION-MAKING ACTIVITIES--The student will be able to:

15.01 Develop the ability to solve problems in a logical sequence.
15.02 Demonstrate the ability to determine proper work priorities.
15.03 Prepare a day's work schedule for the superintendent.
15.04 Choose appropriate action in situations requiring following a chain of command.
15.05 Choose appropriate action in situations requiring effective time management.
15.06 Choose appropriate action in situations requiring application of business ethics.
15.07 Identify ways to assign work to others.

16.0 IDENTIFY AND DEMONSTRATE MANAGEMENT ACTIVITIES--The student will be able to:

16.01 Define management.
16.02 Identify different management styles.
16.03 Identify the major functions of management.
16.04 Demonstrate a knowledge of the relationship between authority and responsibility to task accomplishment.
16.05 Identify problems and make an appropriate decision.
16.06 Develop an OJT training program for new employees.

17.0 DEVELOP A MANAGEMENT AND TRAINING PROGRAM FOR NEW EMPLOYEES--The student will be able to:

17.01 Train new employees in proper shop management.
17.02 Teach new employees how to properly use equipment manuals.
17.03 Train equipment operators on proper and safe equipment operation.
17.04 Train equipment operators how to properly adjust mowing height.
17.05 Develop policies and procedures to be followed by employees caring for turf equipment.

18.0 DEVELOP A PLAN FOR THE FUNCTIONAL USE OF TURF EQUIPMENT MANAGEMENT PERSONNEL--The student will be able to:

18.01 Determine the number of full-time and part-time staff needed.

18.02 Develop a work schedule for turf equipment management personnel.

18.03 Assign daily tasks to turf equipment management personnel.

18.04 Schedule work for smooth operation during times of personnel changes: sick leave, emergency leave, vacations, etc.

18.05 Provide the golf course superintendent with information on the use, maintenance, durability, and general characteristics of turf maintenance.

Florida Department of Education
CLUSTER CURRICULUM FRAMEWORK

Cluster Title: Veterinary And Animal Science And Services
Cluster Type: Job Preparatory
Occupational Area: Agricultural And Natural Resources
Components: Core, Two Programs, with Five Occupational Completion Points

	Secondary	PSAV
Grade Level	9-12, 30, 31	30, 31
Facility Code	203	203
VSO	FFA	PAS
Coop Method	Yes	Yes
Apprenticeship	No	No

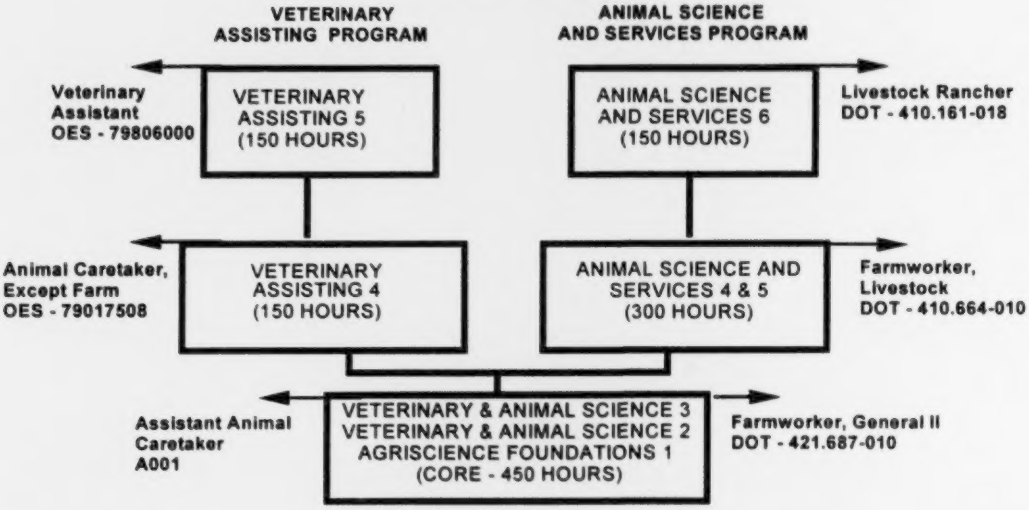
I. **PURPOSE**: The purpose of this cluster is to prepare students for employment or advanced training in the animal industry. The cluster focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the animal industry; planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues and health, safety and environmental issues. The programs in this cluster also provide supplemental training for persons previously or currently employed in the animal industry.

II. **CLUSTER STRUCTURE**: This cluster is a planned sequence of instruction consisting of a core, two programs, and five occupational completion points. When the recommended sequence is followed, the structure will allow students to complete specified portions of the program for employment or remain for advanced training. A student who completes the applicable competencies at any occupational completion point may either continue with the training program or become an occupational completer.

Students must complete the core, or demonstrate the mastery of skills standards contained in the core, before advancing in either of the programs: Veterinary Assisting or Animal Science and Services.

The following diagram illustrates the **CLUSTER STRUCTURE:**

VETERINARY AND ANIMAL SCIENCE AND SERVICES CLUSTER


VETERINARY ASSISTING PROGRAM
ANIMAL SCIENCE AND SERVICES PROGRAM
Veterinary Assistant OES - 79806000
VETERINARY ASSISTING 5 (150 HOURS)
ANIMAL SCIENCE AND SERVICES 6 (150 HOURS)
Livestock Rancher DOT - 410.161-018
Animal Caretaker, Except Farm OES - 79017508
VETERINARY ASSISTING 4 (150 HOURS)
ANIMAL SCIENCE AND SERVICES 4 & 5 (300 HOURS)
Farmworker, Livestock DOT - 410.664-010
Assistant Animal Caretaker A001
VETERINARY & ANIMAL SCIENCE 3
VETERINARY & ANIMAL SCIENCE 2
AGRISCIENCE FOUNDATIONS 1
(CORE - 450 HOURS)
Farmworker, General II DOT - 421.687-010

When offered at the secondary level, the programs in this cluster consist of the following courses which include the core:

Animal Science and Services
    Core
    8106810 - Agriscience Foundations 1 - 1 secondary credit
    8106210 - Veterinary and Animal Science 2 - 1 secondary credit
    8106220 - Veterinary and Animal Science 3 - 1 secondary credit

    8106230 - Animal Science and Services 4 - 1 secondary credit
    8106240 - Animal Science and Services 5 - 1 secondary credit
    8106250 - Animal Science and Services 6 - 1 secondary credit

Veterinary Assisting
    Core
    8106810 - Agriscience Foundations 1 - 1 secondary credit
    8106210 - Veterinary and Animal Science 2 - 1 secondary credit
    8106220 - Veterinary and Animal Science 3 - 1 secondary credit

    8111520 - Veterinary Assisting 4 - 1 secondary credit
    8111530 - Veterinary Assisting 5 - 1 secondary credit

II. **SPECIAL NOTE:** FFA (for secondary) and the National Postsecondary Agricultural Student Organization (for postsecondary) are the appropriate vocational student organizations for providing leadership training and for reinforcing specific vocational skills. Vocational Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.064, FAC.

Classroom, shop, and animal laboratory activities are an integral part of this cluster including the safe use and care of animal health-care instruments, animal grooming equipment, basic tools, animal restraining equipment, and field equipment.

The programs in this cluster may be offered in PSAV courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643, F.S.

Planned and supervised instructional activities must be provided through one or more of the following: (1) directed laboratory experience, (2) student projects, (3) placement for experience, (4) cooperative experience.

Because of the production and marketing cycle of the animal industry, this program requires individual instruction and supervision of students for the entire period beyond the 180-day school year.

The cooperative method of instruction is appropriate for this program. Whenever the cooperative method is offered, the following are required for each student: a training plan that is signed by the student, teacher, and employer,including instructional objectives and a list of on-the-job and in-school learning experiences and a workstation that reflects the equipment, skills, and tasks that are relevant to the occupation that the student has chosen as a career goal. The student must be paid for work performed.

In accordance with Rule 6A-10.040, FAC., the minimum basic skills grade levels required for postsecondary adult vocational students to exit the programs in this cluster are listed at the program level or at the occupational completion points within the program. These grade level numbers correspond to a grade equivalent score obtained on one of the state designated basic skills examinations. If a student does not meet the basic skills level required for completion from the program, remediation should be provided concurrently in the System for Applied Individualized Learning (SAIL) lab. Please reference the Rule for exemptions.

When a secondary student with a disability is enrolled in a vocational class with modifications to the curriculum framework, the particular outcomes and student performance standards which the student must master to earn credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEPs. The job title for which the student is being trained must be designated in the IEP.

SCANS Competencies: Instructional strategies for this program must include methods that require students to identify, organize, and use resources appropriately; to work with each other cooperatively and productively; to acquire and use information; to understand social, organizational, and technological systems; and to work with a variety of tools and equipment. Instructional strategies must also incorporate the methods to improve students' personal qualities and high-order thinking skills.

Equipment List: A generic equipment list is available for this program and is printed in a supplement to this document.

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Florida Department of Education
INTENDED OUTCOMES

Program Title: Animal Science And Services Program

	Secondary	PSAV
Program Numbers	**8106200**	**A010312**
CIP Number	0101.030210	0101.030210
Grade Level	9-12, 30, 31	30, 31
Length	6 credits	900 hours
Certification	VOC AGRI @4	VOC AGRI @4
	AGRI @4	AGRI @2 @4
	AGRICULTUR 1 @2	AGRICULTUR 1 @2
	AGRI PROD #7	AGRI PROD @7 G
Basic Skills		
Math		8
Language		8
Reading		8

INTENDED OUTCOMES: After successfully completing appropriate course(s) for each occupational completion point of this program, the student will be able to perform the following:

OCCUPATIONAL COMPLETION POINT - DATA CODE A
FARMWORKER, GENERAL - DOT Code 421.687-010

01.0 Describe the socioeconomic role of the agricultural industry.
02.0 Apply scientific and technological principles to the agricultural industry.
03.0 Practice agricultural safety.
04.0 Demonstrate the use of tools, equipment and instruments in the agricultural industry.
05.0 Describe the principles of integrated pest management (IPM).
06.0 Describe the principles of plant and/or animal growth and reproduction.
07.0 Apply business skills and economic principles to the agricultural industry.
08.0 Explain the basic marketing processes in the agricultural industry.
09.0 Demonstrate human-relations, communications, and leadership skills.
10.0 Describe animal science and the role of animals in society.
11.0 Identify careers in the animal industry.
12.0 Practice animal and laboratory safety.
13.0 Demonstrate basic first aid for humans.
14.0 Identify parts and functions of various systems of selected animals.
15.0 Recognize normal and abnormal animal behaviors.
16.0 Identify the different digestive systems of animals and the nutritional requirements of selected species.
17.0 Explain the reproductive system and breeding of selected animals.
18.0 Demonstrate knowledge of preventive medicine and disease control.
19.0 Describe the internal and external parasites and the control methods.
20.0 Differentiate between animal welfare and animal rights.
21.0 Demonstrate knowledge of animal control and humane societies.
22.0 Discuss animal marketing techniques.

23.0 Demonstrate employability and interpersonal skills.
24.0 Maintain and analyze records.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
FARMWORKER, LIVESTOCK - DOT Code 410.664-010

25.0 Apply approved nutritional practices.
26.0 Groom, exhibit, and market animals.
27.0 Maintain equipment and facilities.
28.0 Operate, maintain, and repair machinery and equipment.
29.0 Maintain and analyze records.
30.0 Apply animal health practices.
31.0 Perform emergency first aid on animals.

OCCUPATIONAL COMPLETION POINT - DATA CODE C
LIVESTOCK RANCHER - DOT Code 410.161-018

32.0 Identify, select, and breed food-producing animals.
33.0 Plan routine management of food-producing animals and facilities.
34.0 Grow and maintain pasture and forage crops.
35.0 Identify and interpret rules and regulations affecting the livestock industry.

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Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Animal Science And Services
Secondary Number: 8106200
Postsecondary Number: A010312

OCCUPATIONAL COMPLETION POINT - DATA CODE A
FARMWORKER, GENERAL - DOT Code 421.687-010

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.
02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.

06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.
09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

10.0 DESCRIBE ANIMAL SCIENCE AND THE ROLE OF ANIMALS IN SOCIETY--The student will be able to:

10.01 Describe animal science.
10.02 Describe the role of animals in society.

10.03 Locate and obtain informational materials on animal-related topics or issues.

11.0 IDENTIFY CAREERS IN THE ANIMAL INDUSTRY--The student will be able to:

11.01 Locate and obtain information on animal-industry careers and career opportunities.
11.02 Describe various careers in the animal industry.
11.03 Describe training requirements for entry and advancement in animal-industry careers.
11.04 Identify professional organizations and trade journals in the animal industry.

12.0 PRACTICE ANIMAL AND LABORATORY SAFETY-The student will be able to:

12.01 Practice safe procedures when working with animal-related equipment and in laboratory settings.
12.02 Practice safety precautions around animals.
12.03 Discuss the impact of unsafe procedures.
12.04 Define zoonosis.
12.05 Describe selected zoonotic diseases.
12.06 Discuss OHSA as it relates to the animal industry.

13.0 DEMONSTRATE BASIC FIRST AID FOR HUMANS--The student will be able to:

13.01 Locate and use a first aid kit.
13.02 Recognize allergic reactions.
13.03 Describe proper use of eye wash solution.
13.04 Control minor hemorrhage and/or trauma.
13.05 Practice emergency procedures.

14.0 IDENTIFY PARTS AND FUNCTIONS OF VARIOUS SYSTEMS OF SELECTED ANIMALS--The student will be able to:

14.01 Identify parts of the skeletal system of selected animals.
14.02 Compare human skeletal system to that of other animals.
14.03 Identify parts and functions of the following systems of selected animals:
  - respiratory system
  - urinary system
  - digestive system
  - cardiovascular system
  - reproductive system
  - nervous system
14.04 Employ correct terminologies for the variety of animal species and conditions within those species.

15.0 RECOGNIZE NORMAL AND ABNORMAL ANIMAL BEHAVIORS--The student will be able to:

15.01 Distinguish between instinctive and learned behaviors.
15.02 Recognize normal and abnormal behavioral characteristics of animals through observations.
15.03 Recognize signs of aggressive animal behaviors.

15.04 Identify behavioral problems.

16.0 IDENTIFY THE DIFFERENT DIGESTIVE SYSTEMS OF ANIMALS AND THE NUTRITIONAL REQUIREMENTS OF SELECTED SPECIES--The student will be able to:

16 01 Differentiate between ruminants and non-ruminants.
16.02 Differentiate between omnivorous, carnivores, and herbivores.
16.03 Describe the basic nutritional requirements of selected species.
16.04 Analyze different food labels.
16.05 Formulate animal food products.
16.06 Schedule feeding times for selected animals.

17.0 EXPLAIN THE REPRODUCTIVE SYSTEM AND BREEDING OF SELECTED ANIMALS--The student will be able to:

17.01 Describe the male and female reproductive systems.
17.02 Determine sex of animals.
17.03 Determine appropriate age for breeding.
17.04 Identify gestation length.
17.05 Describe estrous cycle.
17.06 Describe breeding techniques.
17.07 Select male and female for breeding.
17.08 Care of breeding stock.
17.09 Care of newborn.
17.10 Explain the differences and similarities between reproduction in animal species.

18.0 DEMONSTRATE KNOWLEDGE OF PREVENTIVE MEDICINE AND DISEASE CONTROL--The student will be able to:

18.01 Describe the importance of preventive medicine for animal health.
18.02 Recognize healthy animals.
18.03 Describe common diseases of animals.
18.04 Describe vaccinations available for disease prevention and vaccination procedures.
18.05 Evaluate and report health conditions of animals.
18.06 Collect urine and feces samples for analysis.
18.07 Describe the process for collecting blood samples for analysis.
18.08 Administer prescribed oral medications.
18.09 Describe the process for administering medications by injection.
18.10 Describe the procedure for safe disposal of medications.
18.11 Discuss the term immunology and active and passive immunity.
18.12 Describe procedures for periodic health check-up.

19.0 DESCRIBE INTERNAL AND EXTERNAL PARASITES AND CONTROL METHODS--The student will be able to:

19.01 Describe the internal and external parasites of selected animals.
19.02 Describe the methods of parasite prevention.
19.03 Describe the methods of parasite control.
19.04 Use a microscope for selected practices.

19.05 Describe the process for fecal sample collection, slide preparation, and examination.

20.0 DIFFERENTIATE BETWEEN ANIMAL WELFARE AND ANIMAL RIGHTS--The student will be able to:

20.01 Define animal welfare and animal rights.
20.02 Explain the differences between animal welfare and animal rights.
20.03 Identify animal welfare and animal rights advocate groups.
20.04 Debate current events concerning animal welfare and animal rights.
20.05 Describe animal cruelty and the consequences of cruel treatment of animals.

21.0 DEMONSTRATE KNOWLEDGE OF ANIMAL CONTROL AND HUMANE SOCIETIES--The student will be able to:

21.01 Differentiate between animal control agencies and humane societies.
21.02 Describe the responsibilities and goals of animal control agencies and humane societies.
21.03 Explain the laws governing each organization.
21.04 Identify and locate local animal control agencies and humane societies.

22.0 DISCUSS ANIMAL MARKETING TECHNIQUES--The student will be able to:

22.01 Demonstrate procedures for preparing, maintaining, and exhibiting animals.
22.02 Collect and interpret market reports and identify market outlets for companion and food-producing animals.

23.0 DEMONSTRATE EMPLOYABILITY AND INTERPERSONAL SKILLS--The student will be able to:

23.01 Demonstrate acceptable employee hygiene habits.
23.02 Demonstrate appropriate responses to criticisms from employer, supervisor, and peers.
23.03 Complete pertinent forms for employment, such as resume, job applications, W-4 forms.
23.04 Demonstrate job interview techniques.
23.05 Explain the Right-To-Know law.

24.0 MAINTAIN AND ANALYZE RECORDS--The student will be able to:

24.01 Maintain and analyze animal records.
24.02 Discuss the legal requirements of maintaining animal health records, and maintain and analyze animal health records.
24.03 Maintain and analyze basic business records (inventory, depreciation, receipts, expenses), using computer applications.
24.04 Maintain supervised agricultural experience (SAE) records.

OCCUPATIONAL COMPLETION POINT - DATA CODE B

FARMWORKER, LIVESTOCK - DOT Code 410.664-010

25.0 APPLY APPROVED NUTRITIONAL PRACTICES--The student will be able to:

25.01 Evaluate animal feed and feeding systems
25.02 Measure and add medication to feed as prescribed.
25.03 Determine amount to feed individual animals.
25.04 Balance a feed ration.

26.0 GROOM, EXHIBIT AND MARKET ANIMALS--The student will be able to:

26.01 Groom selected animals for exhibition.
26.02 Train animals for show and/or exhibition.
26.03 Show and exhibit animals.
26.04 Demonstrate knowledge required to train selected animals to halter.
26.05 Weigh animals.
26.06 Prepare animals for transport.
26.07 Identify market outlets.
26.08 Describe methods of restraining, loading, handling, and transporting animals safely.
26.09 Collect and interpret market reports.
26.10 Determine market grades of animals and animal products.
26.11 Analyze shipping and health certificates.

27.0 MAINTAIN EQUIPMENT AND FACILITIES--The student will be able to:

27.01 Clean and disinfect pens, cages, feeders, waterers, trailers and other equipment.
27.02 Dispose of animal residue and waste.
27.03 Clean and maintain equipment and instruments.
27.04 Repair and maintain pens, cages and other facilities and structures.
27.05 Perform maintenance and minor repair of electrical and plumbing fixtures and equipment.
27.06 Maintain a clean, sanitary and healthy environment for animals.

28.0 OPERATE, MAINTAIN, AND REPAIR MACHINERY AND EQUIPMENT--The student will be able to:

28.01 Use equipment-operator and repair manuals.
28.02 Service and maintain small gasoline engines.
28.03 Operate, service, and maintain tractors and equipment.
28.04 Maintain records of equipment maintenance and repair.
28.05 Prepare equipment for storage.
28.06 Demonstrate proper use of shop and lab equipment.
28.07 Demonstrate safety practices in operating machinery and equipment.

29.0 MAINTAIN AND ANALYZE RECORDS--The student will be able to:

29.01 Maintain and analyze production, performance and breeding records, using computer applications.
29.02 Identify major sources of credit.

29.03 Evaluate leasing and renting agreements.
29.04 Evaluate need for liability and other insurance.
29.05 Analyze records to determine efficiency of operation.
29.06 Maintain machinery, equipment and facilities inventory records.
29.07 Maintain breeding records.
29.08 Prepare an annual budget.
29.09 Maintain and analyze basic business records (inventory, depreciation, receipts, expenses), using computer applications.
29.10 Plan a work schedule.
29.11 Maintain personnel and labor records.
29.12 Maintain supervised agricultural experience records.
29.13 Discuss the legal requirements of maintaining animal health records, and maintain and analyze health records.

30.0 APPLY ANIMAL HEALTH PRACTICES--The student will be able to:

30.01 Evaluate and report common ailments of animals (diseases, disorders associated with feeding, stress, internal and external parasites).
30.02 Administer prescribed oral medications (under supervision).
30.03 Administer prescribed injections (under supervision).
30.04 Locate injection points of selected animals (under supervision).
30.05 Sterilize instruments and supplies.
30.06 Interpret and follow directions on medications and animal health aids, including withholding milk from cows on medication and the control of mastitis.
30.07 Dip, spray, or dust animals for external parasites (under supervision).
30.08 Dispose of empty chemical and medical containers as prescribed.
30.09 Dispose of deceased animals as prescribed.
30.10 Store medications and chemicals safely and securely.
30.11 Select and administer growth stimulants and implants (under supervision).
30.12 Discuss castration, dehorning, docking, and debeaking.

31.0 PERFORM EMERGENCY FIRST AID ON ANIMALS--The student will be able to:

31.01 Evaluate the health status of the animals.
31.02 Isolate injured animals.
31.03 Cleanse wounds.
31.04 Apply antiseptic.
31.05 Immobilize fractured limbs.
31.06 Identify and stop external bleeding.
31.07 Seek additional medical attention for animals when required.

OCCUPATIONAL COMPLETION POINT - DATA CODE C
LIVESTOCK RANCHER - DOT Code 410.161-018

32.0 IDENTIFY, SELECT, AND BREED FOOD-PRODUCING ANIMALS--The student will be able to:

32.01 Appraise animal conformation and desirable characteristics and breeds.
32.02 Determine age to breed selected animals.

32.03 Describe estrous cycle of food-producing animals.
32.04 Describe breeding techniques, including artificial insemination.
32.05 Cull offspring.
32.06 Describe basic animal genetics.
32.07 Identify signs of parturition.
32.08 Identify common disorders of parturition.
32.09 Prepare animals and facilities for parturition.
32.10 Assist in the delivery of newborn animals.

33.0 PLAN ROUTINE MANAGEMENT OF FOOD-PRODUCING ANIMALS AND FACILITIES--The student will be able to:

33.01 Schedule feeding and care of animals.
33.02 Order supplies and animal feeds.
33.03 Develop training and exercise schedule for animal.
33.04 Plan for routine maintenance of equipment and facilities.
33.05 Assist in the planning of a routine animal health and preventative medication program.
33.06 Implement and maintain sanitary conditions for animals including young.
33.07 Separate non-compatible animals.
33.08 Observe animals on a regular basis for problems or stress.
33.09 Develop a calendar of operations for a selected animal operation.

34.0 GROW AND MAINTAIN PASTURE AND FORAGE CROPS--The student will be able to:

34.01 Compare pasture, forage and feed crop production and harvesting systems.
34.02 Assist in determining pasture and forage needs.
34.03 Take a soil sample and interpret results.
34.04 Describe soil and water conservation practices.
34.05 Determine range and pasture quality.
34.06 Prepare soil for feed, pasture and forage crops.
34.07 Plant and grow feed, pasture and forage crops.
34.08 Fertilize feed, pasture and forage crops.
34.09 Control noxious weeds and pests in crops.
34.10 Harvest forage and feed crops.
34.11 Store harvested feed and forage crops.
34.12 Assist in the development of a plan for the rotation of fields, pens and pastures.

35.0 IDENTIFY AND INTERPRET RULES AND REGULATIONS AFFECTING THE LIVESTOCK INDUSTRY.--The student will be able to:

35.01 Maintain a file of current livestock rules and regulations.
35.02 Secure professional services and information.
35.03 Observe EPA pesticide use regulations.
35.04 Identify the procedures and requirements for obtaining a restricted use pesticide applicator's license.
35.05 Observe regulations regarding the use of medications and growth stimulants.
35.06 Observe state and federal regulations regarding brucellosis testing/eradication programs and other programs.

35.07 Identify applicable land-use and zoning regulations.

35.08 Identify agencies affecting land and wildlife utilization (e.g., DNR, DEP, EPA)

35.09 Identify agencies regulating employee/employer relations (e.g., OSHA).

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106810
Course Title: Agriscience Foundations I
Course Credit: 1

COURSE DESCRIPTION:

This course was developed as a core and is designed to develop competencies in the areas of agricultural history; global importance of agriculture; career opportunities; applied scientific and technological concepts; ecosystems; agricultural safety; principles of integrated pest management; principles of plant and animal growth; economic principles; agricultural marketing; and human-relations skills.

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.

02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.

09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106210
Course Title: Veterinary and Animal Science 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of safety; animal behavior; animal welfare; animal control; and employability skills.

10.0 DESCRIBE ANIMAL SCIENCE AND THE ROLE OF ANIMALS IN SOCIETY--The student will be able to:

10.01 Describe animal science.
10.02 Describe the role of animals in society.
10.03 Locate and obtain informational materials on animal-related topics or issues.

11.0 IDENTIFY CAREERS IN THE ANIMAL INDUSTRY--The student will be able to:

11.01 Locate and obtain information on animal-industry careers and career opportunities.
11.02 Describe various careers in the animal industry.
11.03 Describe training requirements for entry and advancement in animal-industry careers.
11.04 Identify professional organizations and trade journals in the animal industry.

12.0 PRACTICE ANIMAL AND LABORATORY SAFETY-The student will be able to:

12.01 Practice safe procedures when working with animal-related equipment and in laboratory settings.
12.02 Practice safety precautions around animals.
12.03 Discuss the impact of unsafe procedures.
12.04 Define zoonosis.
12.05 Describe selected zoonotic diseases.
12.06 Discuss OHSA as it relates to the animal industry.

13.0 DEMONSTRATE BASIC FIRST AID FOR HUMANS--The student will be able to:

13.01 Locate and use a first aid kit.
13.02 Recognize allergic reactions.
13.03 Describe proper use of eye wash solution.
13.04 Control minor hemorrhage and/or trauma.
13.05 Practice emergency procedures.

14.0 IDENTIFY PARTS AND FUNCTIONS OF VARIOUS SYSTEMS OF SELECTED ANIMALS--The student will be able to:

14.01 Identify parts of the skeletal system of selected animals.

14.02 Compare human skeletal system to that of other animals.
14.03 Identify parts and functions of the following systems of selected animals:
- respiratory system
- urinary system
- digestive system
- cardiovascular system
- reproductive system
- nervous system

14.04 Employ correct terminologies for the variety of animal species and conditions within those species.

15.0 RECOGNIZE NORMAL AND ABNORMAL ANIMAL BEHAVIORS--The student will be able to:

15.01 Distinguish between instinctive and learned behaviors.
15.02 Recognize normal and abnormal behavioral characteristics of animals through observations.
15.03 Recognize signs of aggressive animal behaviors.
15.04 Identify behavioral problems.

20.0 DIFFERENTIATE BETWEEN ANIMAL WELFARE AND ANIMAL RIGHTS--The student will be able to:

20.01 Define animal welfare and animal rights.
20.02 Explain the differences between animal welfare and animal rights.
20.03 Identify animal welfare and animal rights advocate groups.
20.04 Debate current events concerning animal welfare and animal rights.
20.05 Describe animal cruelty and the consequences of cruel treatment of animals.

21.0 DEMONSTRATE KNOWLEDGE OF ANIMAL CONTROL AND HUMANE SOCIETIES--The student will be able to:

21.01 Differentiate between animal control agencies and humane societies.
21.02 Describe the responsibilities and goals of animal control agencies and humane societies.
21.03 Explain the laws governing each organization.
21.04 Identify and locate local animal control agencies and humane societies.

23.0 DEMONSTRATE EMPLOYABILITY AND INTERPERSONAL SKILLS--The student will be able to:

23.01 Demonstrate acceptable employee hygiene habits.
23.02 Demonstrate appropriate responses to criticisms from employer, supervisor, and peers.
23.03 Complete pertinent forms for employment, such as resume, job applications, W-4 forms.
23.04 Demonstrate job interview techniques.
23.05 Explain the Right-To-Know law.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106220
Course Title: Veterinary and Animal Science 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of animal digestive systems; animal breeding; preventive medicine and disease control; control of parasites; animal marketing; and analyzing records.

16.0 IDENTIFY THE DIFFERENT DIGESTIVE SYSTEMS OF ANIMALS AND THE NUTRITIONAL REQUIREMENTS OF SELECTED SPECIES--The student will be able to:

16.01 Differentiate between ruminants and non-ruminants.
16.02 Differentiate between omnivorous, carnivores, and herbivores.
16.03 Describe the basic nutritional requirements of selected species.
16.04 Analyze different food labels.
16.05 Formulate animal food products.
16.06 Schedule feeding times for selected animals.

17.0 EXPLAIN THE REPRODUCTIVE SYSTEM AND BREEDING OF SELECTED ANIMALS--The student will be able to:

17.01 Describe the male and female reproductive systems.
17.02 Determine sex of animals.
17.03 Determine appropriate age for breeding.
17.04 Identify gestation length.
17.05 Describe estrous cycle.
17.06 Describe breeding techniques.
17.07 Select male and female for breeding.
17.08 Care of breeding stock.
17.09 Care of newborn.
17.10 Explain the differences and similarities between reproduction in animal species.

18.0 DEMONSTRATE KNOWLEDGE OF PREVENTIVE MEDICINE AND DISEASE CONTROL--The student will be able to:

18.01 Describe the importance of preventive medicine for animal health.
18.02 Recognize healthy animals.
18.03 Describe common diseases of animals.
18.04 Describe vaccinations available for disease prevention and vaccination procedures.
18.05 Evaluate and report health conditions of animals.
18.06 Collect urine and feces samples for analysis.
18.07 Describe the process for collecting blood samples for analysis.
18.08 Administer prescribed oral medications.
18.09 Describe the process for administering medications by injection.

18.10 Describe the procedure for safe disposal of medications.
18.11 Discuss the term immunology and active and passive immunity.
18.12 Describe procedures for periodic health check-up.

19.0 DESCRIBE INTERNAL AND EXTERNAL PARASITES AND CONTROL METHODS--The student will be able to:

19.01 Describe the internal and external parasites of selected animals.
19.02 Describe the methods of parasite prevention.
19.03 Describe the methods of parasite control.
19.04 Use a microscope for selected practices.
19.05 Describe the process for fecal sample collection, slide preparation, and examination.

22.0 DISCUSS ANIMAL MARKETING TECHNIQUES--The student will be able to:

22.01 Demonstrate procedures for preparing, maintaining, and exhibiting animals.
22.02 Collect and interpret market reports and identify market outlets for companion and food-producing animals.

24.0 MAINTAIN AND ANALYZE RECORDS--The student will be able to:

24.01 Maintain and analyze animal records.
24.02 Discuss the legal requirements of maintaining animal health records, and maintain and analyze animal health records.
24.03 Maintain and analyze basic business records (inventory, depreciation, receipts, expenses), using computer applications.
24.04 Maintain supervised agricultural experience (SAE) records.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106230
Course Title: Animal Science and Services 4
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of nutrition; grooming, exhibiting and marketing animals; operation, maintenance and repair of equipment.

25.0 APPLY APPROVED NUTRITIONAL PRACTICES--The student will be able to:

25.01 Evaluate animal feed and feeding systems.
25.02 Measure and add medication to feed as prescribed.
25.03 Determine amount to feed individual animals.
25.04 Balance a feed ration.

26.0 GROOM, EXHIBIT AND MARKET ANIMALS--The student will be able to:

26.01 Groom selected animals for exhibition.
26.02 Train animals for show and/or exhibition.
26.03 Show and exhibit animals.
26.04 Demonstrate knowledge required to train selected animals to halter.
26.05 Weigh animals.
26.06 Prepare animals for transport.
26.07 Identify market outlets.
26.08 Describe methods of restraining, loading, handling, and transporting animals safely.
26.09 Collect and interpret market reports.
26.10 Determine market grades of animals and animal products.
26.11 Analyze shipping and health certificates.

27.0 MAINTAIN EQUIPMENT AND FACILITIES--The student will be able to:

27.01 Clean and disinfect pens, cages, feeders, waterers, trailers and other equipment.
27.02 Dispose of animal residue and waste.
27.03 Clean and maintain equipment and instruments.
27.04 Repair and maintain pens, cages and other facilities and structures.
27.05 Perform maintenance and minor repair of electrical and plumbing fixtures and equipment.
27.06 Maintain a clean, sanitary and healthy environment for animals.

28.0 OPERATE, MAINTAIN, AND REPAIR MACHINERY AND EQUIPMENT--The student will be able to:

28.01 Use equipment-operator and repair manuals.

28.02 Service and maintain small gasoline engines.
28.03 Operate, service, and maintain tractors and equipment.
28.04 Maintain records of equipment maintenance and repair.
28.05 Prepare equipment for storage.
28.06 Demonstrate proper use of shop and lab equipment.
28.07 Demonstrate safety practices in operating machinery and equipment.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106240
Course Title: Animal Science and Services 5
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of maintaining and analyzing records; animal health practices; and emergency first aid for animals.

29.0 MAINTAIN AND ANALYZE RECORDS--The student will be able to:

29.01 Maintain and analyze production, performance and breeding records, using computer applications.
29.02 Identify major sources of credit.
29.03 Evaluate leasing and renting agreements.
29.04 Evaluate need for liability and other insurance.
29.05 Analyze records to determine efficiency of operation.
29.06 Maintain machinery, equipment and facilities inventory records.
29.07 Maintain breeding records.
29.08 Prepare an annual budget.
29.09 Maintain and analyze basic business records (inventory, depreciation, receipts, expenses), using computer applications.
29.10 Plan a work schedule.
29.11 Maintain personnel and labor records.
29.12 Maintain supervised agricultural experience records.
29.13 Discuss the legal requirements of maintaining animal health records, and maintain and analyze health records.

30.0 APPLY ANIMAL HEALTH PRACTICES--The student will be able to:

30.01 Evaluate and report common ailments of animals (diseases, disorders associated with feeding, stress, internal and external parasites).
30.02 Administer prescribed oral medications (under supervision).
30.03 Administer prescribed injections (under supervision).
30.04 Locate injection points of selected animals (under supervision).
30.05 Sterilize instruments and supplies.
30.06 Interpret and follow directions on medications and animal health aids, including withholding milk from cows on medication and the control of mastitis.
30.07 Dip, spray, or dust animals for external parasites (under supervision).
30.08 Dispose of empty chemical and medical containers as prescribed.
30.09 Dispose of deceased animals as prescribed.
30.10 Store medications and chemicals safely and securely.
30.11 Select and administer growth stimulants and implants (under supervision).
30.12 Discuss castration, dehorning, docking, and debeaking.

31.0 PERFORM EMERGENCY FIRST AID ON ANIMALS--The student will be able to:

31.01 Evaluate the health status of the animals.
31.02 Isolate injured animals.
31.03 Cleanse wounds.
31.04 Apply antiseptic.
31.05 Immobilize fractured limbs.
31.06 Identify and stop external bleeding.
31.07 Seek additional medical attention for animals when required.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106250
Course Title: Animal Science and Services 6
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of identifying, selecting and breeding food-producing animals; management; growing and maintaining pasture and forage crops; and interpreting rules and regulations affecting the livestock industry.

32.0 IDENTIFY, SELECT, AND BREED FOOD-PRODUCING ANIMALS--The student will be able to:

32.01 Appraise animal conformation and desirable characteristics and breeds.
32.02 Determine age to breed selected animals.
32.03 Describe estrous cycle of food-producing animals.
32.04 Describe breeding techniques, including artificial insemination.
32.05 Cull offspring.
32.06 Describe basic animal genetics.
32.07 Identify signs of parturition.
32.08 Identify common disorders of parturition.
32.09 Prepare animals and facilities for parturition.
32.10 Assist in the delivery of newborn animals.

33.0 PLAN ROUTINE MANAGEMENT OF FOOD-PRODUCING ANIMALS AND FACILITIES--The student will be able to:

33.01 Schedule feeding and care of animals.
33.02 Order supplies and animal feeds.
33.03 Develop training and exercise schedule for animal.
33.04 Plan for routine maintenance of equipment and facilities.
33.05 Assist in the planning of a routine animal health and preventative medication program.
33.06 Implement and maintain sanitary conditions for animals including young.
33.07 Separate non-compatible animals.
33.08 Observe animals on a regular basis for problems or stress.
33.09 Develop a calendar of operations for a selected animal operation.

34.0 GROW AND MAINTAIN PASTURE AND FORAGE CROPS--The student will be able to:

34.01 Compare pasture, forage and feed crop production and harvesting systems.
34.02 Assist in determining pasture and forage needs.
34.03 Take a soil sample and interpret results.
34.04 Describe soil and water conservation practices.

34.05 Determine range and pasture quality.
34.06 Prepare soil for feed, pasture and forage crops.
34.07 Plant and grow feed, pasture and forage crops.
34.08 Fertilize feed, pasture and forage crops.
34.09 Control noxious weeds and pests in crops.
34.10 Harvest forage and feed crops.
34.11 Store harvested feed and forage crops.
34.12 Assist in the development of a plan for the rotation of fields, pens and pastures.

35.0 IDENTIFY AND INTERPRET RULES AND REGULATIONS AFFECTING THE LIVESTOCK INDUSTRY--The student will be able to:

35.01 Maintain a file of current livestock rules and regulations.
35.02 Secure professional services and information.
35.03 Observe EPA pesticide use regulations.
35.04 Identify the procedures and requirements for obtaining a restricted use pesticide applicator's license.
35.05 Observe regulations regarding the use of medications and growth stimulants.
35.06 Observe state and federal regulations regarding brucellosis testing/eradication programs and other programs.
35.07 Identify applicable land-use and zoning regulations.
35.08 Identify agencies affecting land and wildlife utilization (e.g., DNR, DEP, EPA)
35.09 Identify agencies regulating employee/employer relations (e.g., OSHA).

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Florida Department of Education
INTENDED OUTCOMES

Program Title: Veterinary Assisting Program

	Secondary	PSAV
Program Numbers	**8115110**	**A010512**
CIP Number	0117.051210	0117.051210
Grade Level	9-12, 30, 31	30, 31
Length	5 credits	750 hours
Certification	VOC AGRI @4	VOC AGRI @4
	AGRI @4	AGRI @2 @4
	AGRICULTUR 1 @2	AGRICULTUR 1 @2
	AG SUPPLI #7	AG SUPPLI @7 G
Basic Skills		
Math		8
Language		8
Reading		8

INTENDED OUTCOMES: After successfully completing appropriate course(s) for each occupational completion point of this program, the student will be able to perform the following:

OCCUPATIONAL COMPLETION POINT - DATA CODE A

ASSISTANT ANIMAL CARETAKER - Industry Title

01.0 Describe the socioeconomic role of the agricultural industry.
02.0 Apply scientific and technological principles to the agricultural industry.
03.0 Practice agricultural safety.
04.0 Demonstrate the use of tools, equipment and instruments in the agricultural industry.
05.0 Describe the principles of integrated pest management (IPM).
06.0 Describe the principles of plant and/or animal growth and reproduction.
07.0 Apply business skills and economic principles to the agricultural industry.
08.0 Explain the basic marketing processes in the agricultural industry.
09.0 Demonstrate human-relations, communications, and leadership skills.
10.0 Describe animal science and the role of animals in society.
11.0 Identify careers in the animal industry.
12.0 Practice animal and laboratory safety.
13.0 Demonstrate basic first aid for humans.
14.0 Identify parts and functions of various systems of selected animals.
15.0 Recognize normal and abnormal animal behaviors.
16.0 Identify the different digestive systems of animals and the nutritional requirements of selected species.
17.0 Explain the reproductive system and breeding of selected animals.
18.0 Demonstrate knowledge of preventive medicine and disease control.
19.0 Describe the internal and external parasites and the control methods.
20.0 Differentiate between animal welfare and animal rights.
21.0 Demonstrate knowledge of animal control and humane societies.
22.0 Discuss animal marketing techniques.

23.0 Demonstrate employability and interpersonal skills.
24.0 Maintain and analyze records.

OCCUPATIONAL COMPLETION POINT - DATA CODE B
ANIMAL CARETAKERS, EXCEPT FARM - OES Code 79017502

25.0 Restrain and control animals.
26.0 Demonstrate proper use of veterinary science terminologies.
27.0 Demonstrate basic first aid for companion animals.
28.0 Identify breeds in each of the several species of companion animals.
29.0 Groom selected companion animals.
30.0 Describe the problems, causes, and solutions of animal overpopulation.
31.0 Describe exotic animals and the effects of domestication on them.

OCCUPATIONAL COMPLETION POINT - DATA CODE C
VETERINARY ASSISTANT - OES Code 79806000

32.0 Discuss the human-animal bond and it's effects on human health.
33.0 Locate and interpret animal-related laws.
34.0 Explain the roles of animals in research.
35.0 Describe the principles of genetics and biotechnology in reproduction.
36.0 Demonstrate knowledge of enterprise management.

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Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Veterinary Assisting
Secondary Number: 8115110
Postsecondary Number: A010512

OCCUPATIONAL COMPLETION POINT - DATA CODE A
ASSISTANT ANIMAL CARETAKER - Industry Title

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.
02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.

06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.
09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

10.0 DESCRIBE ANIMAL SCIENCE AND THE ROLE OF ANIMALS IN SOCIETY--The student will be able to:

10.01 Describe animal science.
10.02 Describe the role of animals in society.

10.03 Locate and obtain informational materials on animal-related topics or issues.

11.0 IDENTIFY CAREERS IN THE ANIMAL INDUSTRY--The student will be able to:

11.01 Locate and obtain information on animal-industry careers and career opportunities.
11.02 Describe various careers in the animal industry.
11.03 Describe training requirements for entry and advancement in animal-industry careers.
11.04 Identify professional organizations and trade journals in the animal industry.

12.0 PRACTICE ANIMAL AND LABORATORY SAFETY--The student will be able to:

12.01 Practice safe procedures when working with animal-related equipment and in laboratory settings.
12.02 Practice safety precautions around animals.
12.03 Discuss the impact of unsafe procedures.
12.04 Define zoonosis.
12.05 Describe selected zoonotic diseases.
12.06 Discuss OHSA as it relates to the animal industry.

13.0 DEMONSTRATE BASIC FIRST AID FOR HUMANS--The student will be able to:

13.01 Locate and use a first aid kit.
13.02 Recognize allergic reactions.
13.03 Describe proper use of eye wash solution.
13.04 Control minor hemorrhage and/or trauma.
13.05 Practice emergency procedures.

14.0 IDENTIFY PARTS AND FUNCTIONS OF VARIOUS SYSTEMS OF SELECTED ANIMALS--The student will be able to:

14.01 Identify parts of the skeletal system of selected animals.
14.02 Compare human skeletal system to that of other animals.
14.03 Identify parts and functions of the following systems of selected animals:
    - respiratory system
    - urinary system
    - digestive system
    - cardiovascular system
    - reproductive system
    - nervous system
14.04 Employ correct terminologies for the variety of animal species and conditions within those species.

15.0 RECOGNIZE NORMAL AND ABNORMAL ANIMAL BEHAVIORS--The student will be able to:

15.01 Distinguish between instinctive and learned behaviors.
15.02 Recognize normal and abnormal behavioral characteristics of animals through observations.
15.03 Recognize signs of aggressive animal behaviors.

15.04 Identify behavioral problems.

16.0 IDENTIFY THE DIFFERENT DIGESTIVE SYSTEMS OF ANIMALS AND THE NUTRITIONAL REQUIREMENTS OF SELECTED SPECIES--The student will be able to:

16.01 Differentiate between ruminants and non-ruminants.
16.02 Differentiate between omnivorous, carnivores, and herbivores.
16.03 Describe the basic nutritional requirements of selected species.
16.04 Analyze different food labels.
16.05 Formulate animal food products.
16.06 Schedule feeding times for selected animals.

17.0 EXPLAIN THE REPRODUCTIVE SYSTEM AND BREEDING OF SELECTED ANIMALS--The student will be able to:

17.01 Describe the male and female reproductive systems.
17.02 Determine sex of animals.
17.03 Determine appropriate age for breeding.
17.04 Identify gestation length.
17.05 Describe estrous cycle.
17.06 Describe breeding techniques.
17.07 Select male and female for breeding.
17.08 Care of breeding stock.
17.09 Care of newborn.
17.10 Explain the differences and similarities between reproduction in animal species.

18.0 DEMONSTRATE KNOWLEDGE OF PREVENTIVE MEDICINE AND DISEASE CONTROL--The student will be able to:

18.01 Describe the importance of preventive medicine for animal health.
18.02 Recognize healthy animals.
18.03 Describe common diseases of animals.
18.04 Describe vaccinations available for disease prevention and vaccination procedures.
18.05 Evaluate and report health conditions of animals.
18.06 Collect urine and feces samples for analysis.
18.07 Describe the process for collecting blood samples for analysis.
18.08 Administer prescribed oral medications.
18.09 Describe the process for administering medications by injection.
18.10 Describe the procedure for safe disposal of medications.
18.11 Discuss the term immunology and active and passive immunity.
18.12 Describe procedures for periodic health check-up.

19.0 DESCRIBE INTERNAL AND EXTERNAL PARASITES AND CONTROL METHODS--The student will be able to:

19.01 Describe the internal and external parasites of selected animals.
19.02 Describe the methods of parasite prevention.
19.03 Describe the methods of parasite control.
19.04 Use a microscope for selected practices.

19.05 Describe the process for fecal sample collection, slide preparation, and examination.

20.0 DIFFERENTIATE BETWEEN ANIMAL WELFARE AND ANIMAL RIGHTS--The student will be able to:

20.01 Define animal welfare and animal rights.
20.02 Explain the differences between animal welfare and animal rights.
20.03 Identify animal welfare and animal rights advocate groups.
20.04 Debate current events concerning animal welfare and animal rights.
20.05 Describe animal cruelty and the consequences of cruel treatment of animals.

21.0 DEMONSTRATE KNOWLEDGE OF ANIMAL CONTROL AND HUMANE SOCIETIES--The student will be able to:

21.01 Differentiate between animal control agencies and humane societies.
21.02 Describe the responsibilities and goals of animal control agencies and humane societies.
21.03 Explain the laws governing each organization.
21.04 Identify and locate local animal control agencies and humane societies.

22.0 DISCUSS ANIMAL MARKETING TECHNIQUES--The student will be able to:

22.01 Demonstrate procedures for preparing, maintaining, and exhibiting animals.
22.02 Collect and interpret market reports and identify market outlets for companion and food-producing animals.

23.0 DEMONSTRATE EMPLOYABILITY AND INTERPERSONAL SKILLS--The student will be able to:

23.01 Demonstrate acceptable employee hygiene habits.
23.02 Demonstrate appropriate responses to criticisms from employer, supervisor, and peers.
23.03 Complete pertinent forms for employment, such as resume, job applications, W-4 forms.
23.04 Demonstrate job interview techniques.
23.05 Explain the Right-To-Know law.

24.0 MAINTAIN AND ANALYZE RECORDS--The student will be able to:

24.01 Maintain and analyze animal records.
24.02 Discuss the legal requirements of maintaining animal health records, and maintain and analyze animal health records.
24.03 Maintain and analyze basic business records (inventory, depreciation, receipts, expenses), using computer applications.
24.04 Maintain supervised agricultural experience (SAE) records.

OCCUPATIONAL COMPLETION POINT - DATA CODE B

25.0 RESTRAIN AND CONTROL ANIMALS--The student will be able to:

25.01 Describe behavioral changes due to aging.
25.02 Recognize signs of aggressive behaviors of companion animals.
25.03 Determine the appropriate restraining methods for specified behaviors.
25.04 Determine the level of restraint needed for the animal.
25.05 Verbally restrain animals.
25.06 Physically restrain animals.
25.07 Discuss chemical restraint of animals.
25.08 Describe complications encountered when restraining animals.

26.0 DEMONSTRATE PROPER USE OF VETERINARY SCIENCE TERMINOLOGIES--The student will be able to:

26.01 Define common veterinary terminologies.
26.02 Define common medical terminologies.
26.03 Apply prefixes and suffixes for veterinary medical terminologies.
26.04 Define gender and species-related terminologies.

27.0 DEMONSTRATE BASIC FIRST AID FOR COMPANION ANIMALS--The student will be able to:

27.01 Evaluate emergency health (physical and behavioral) status.
27.02 Restrain and move injured animals.
27.03 Demonstrate hemorrhage control.
27.04 Dress wounds and punctures.
27.05 Demonstrate the correct emergency procedures for shock, burns, heatstroke, and fractures.
27.06 Describe and access up-to-date information on animal health.
27.07 Demonstrate animal CPR.

28.0 IDENTIFY BREEDS IN EACH OF THE SEVERAL SPECIES OF COMPANION ANIMALS--The student will be able to:

28.01 Identify canine groups and breed characteristics.
28.02 Identify feline groups and breed characteristics.
28.03 Identify equine breeds and their primary use.
28.04 Identify breeds of rabbits and their primary use.
28.05 Identify avian species.
28.06 Write a physical description of any companion animal.

29.0 GROOM SELECTED COMPANION ANIMALS--The student will be able to:

29.01 Select, maintain, and demonstrate safe use of the grooming equipment.
29.02 Groom companion animals.
29.03 Clip animals.
29.04 Show and exhibit selected animals.
29.05 Read and interpret labels on grooming products.

30.0 DESCRIBE THE PROBLEMS, CAUSES, AND SOLUTIONS OF ANIMAL OVERPOPULATION--The student will be able to:

30.01 Explain the concept of overpopulation of companion animals.
30.02 Describe the causes of animal overpopulation and the problems it creates.
30.03 Define euthanasia and describe its role in animal overpopulation.
30.04 Identify organizations involved in the public education of animal overpopulation.
30.05 Explain the pet owners' and society's responsibilities concerning animal overpopulation.

31.0 DESCRIBE EXOTIC ANIMALS AND THE EFFECTS OF DOMESTICATION ON THEM--The student will be able to:

31.01 Define exotic animal.
31.02 Identify exotic animals native to Florida.
31.03 Explain the effects of urbanization on the wildlife population.
31.04 Describe the roles of the Florida Game and Fresh Water Fish Commission in wildlife management.
31.05 Explain the effects of state, national, and international laws on the domestication of the exotic animals.
31.06 Distinguish which exotic animals can and which cannot be domesticated.
31.07 Debate consequences resulting from the domestication of exotic animals.

OCCUPATIONAL COMPLETION POINT - DATA CODE C
VETERINARY ASSISTANT - Industry Title

32.0 DISCUSS THE HUMAN-ANIMAL BOND AND IT'S EFFECTS ON HUMAN HEALTH--The student will be able to:

32.01 Explain the human-animal bond.
32.02 Discuss the positive health effects on people resulting from their interaction with animals.
32.03 Discuss programs which use human-animal interaction as a therapy tool.
32.04 Describe the characteristics of animals used in the animal-facilitated therapy programs.
32.05 Describe national and local programs which use animal-facilitated therapy.
32.06 Discuss grief response and emotional impact of animal loss.

33.0 LOCATE AND INTERPRET ANIMAL-RELATED LAWS--The student will be able to:

33.01 Describe local animal control laws.
33.02 Demonstrate knowledge of local and state animal regulations.
33.03 Determine the legal limitations of duties of an employee in the animal services industry.
33.04 Identify when an Animal Health Certificate is required.
33.05 Explain the laws governing the sale of animals and the disposal of animals.

34.0 EXPLAIN THE ROLE OF ANIMALS IN RESEARCH--The student will be able to:

34.01 Describe the history of the role of animals in research.
34.02 Discuss medical advances made possible through the use of animals in research.
34.03 Define USDA and explain it's roles in using animals for research.
34.04 Describe the role of the Institute of Animal Care and Use Committee (IACUC) with regard to animal research facilities.
34.05 Explain the controversy over using animals in research.
34.06 Identify organizations which are in favor of and those which are against the use of animals in research.
34.07 Develop a personal position on the use of animals in research and support that position.

35.0 DESCRIBE THE PRINCIPLES OF GENETICS AND BIOTECHNOLOGY IN REPRODUCTION--The student will be able to:

35.01 Define genetics and discuss genetic principles.
35.02 Explain biotechnology.
35.03 Discuss Mendelian genetics.
35.04 Develop a Mendel chart.
35.05 Define hereditary and environmental variation.
35.06 Explain the differences between purebreeding, inbreeding, linebreeding, outbreeding, selective breeding, linecrossing, and outcrossing.
35.07 Describe dominate and recessive genes.
35.08 Define and explain heritability estimates.

36.0 DEMONSTRATE KNOWLEDGE OF ENTERPRISE MANAGEMENT--The student will be able to:

36.01 Describe enterprise management.
36.02 Describe the economic principles that affect enterprise management.
36.03 Discuss the advantages and disadvantages of entrepreneurship.
36.04 Discuss common decision-making procedures in a particular animal-industry enterprise.
36.05 Investigate the economic and marketing aspects of kennels, catteries, paddocks, the rabbit industry, and exotic animal services.
36.06 Demonstrate proper sanitation techniques for a kennel, cattery, paddock, rabbitry, and zoo.
36.07 Describe methods of preventive medicine and quarantine for disease control in a kennel, cattery, paddock, rabbitry, and zoo.
36.08 Investigate the economic and marketing aspects in pet stores.

Program: 8115110 Veterinary Assisting

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106810
Course Title: Agriscience Foundations I
Course Credit: 1

COURSE DESCRIPTION:

This course was developed as a core and is designed to develop competencies in the areas of agricultural history; global importance of agriculture; career opportunities; applied scientific and technological concepts; ecosystems; agricultural safety; principles of integrated pest management; principles of plant and animal growth; economic principles; agricultural marketing; and human-relations skills.

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

01.01 Prepare a report on the history of the agricultural industry.
01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy.
01.03 Investigate career opportunities in the agricultural industry and identify educational experiences which would prepare one for those careers.
01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment.

02.0 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

02.01 Discuss the importance of scientific classification in agriculture.
02.02 Use the scientific method to solve problems in agriculture.
02.03 Explain the use of genetics in agriculture, including probability applications.
02.04 Analyze the impact of recent technology on the agricultural industry.
02.05 Identify and describe the components of an ecosystem both biotic and abiotic.
02.06 Construct and analyze a diagram of a biological food web and subsequent food chains.
02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles.
02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices.
02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources.
02.10 Explain the interaction of one natural resource on another.
02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution.

02.12 Explain the flow of energy from the sun through agricultural systems.
02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system.
02.14 Apply principles of waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

03.01 List the most common causes of agricultural accidents.
03.02 Discuss the importance of following proper safety precautions in the agricultural industry.
03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace.
03.04 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).

04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:

04.01 Choose the proper tools, equipment, and instruments for a specific job.
04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
04.03 Demonstrate the ability to use an equipment manual.
04.04 Demonstrate the use of selected tools, equipment, and instruments.
04.05 Service, maintain, and store tools, equipment, instruments, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM)--The student will be able to:

05.01 Identify types of pests.
05.02 Identify and select an appropriate control for each type of pest and/or weed.
05.03 Describe symptoms of pesticide poisoning.
05.04 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS).
05.05 Select, mix, and apply a nonrestricted chemical, according to the label (including EPA, MSDS, and Worker Protection Standard).
05.06 Clean and store pesticide application equipment, safety clothing, and safety equipment.
05.07 Identify the proper disposal of containers and residual pesticides.
05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL GROWTH AND REPRODUCTION--The student will be able to:

For plant:

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
06.02 Describe the functions of roots, stems, leaves, and flowers.
06.03 Propagate plants through sexual and asexual means.
06.04 Identify the nutrients required for plant growth and development.
06.05 Extract pertinent information from a fertilizer label.
06.06 Discuss the short- and long-range impact of fertilizer on people and the environment.

For animal:

06.07 Identify, the nutrients (oxygen, protein, carbohydrates, fats, minerals, and vitamins) required for animal growth and development.
06.08 Identify and describe the anatomical systems of animals including major components (skeletal system, bones; digestive system, stomach and intestines; etc.).
06.09 Describe the process of animal reproduction.

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

07.01 Explain the basic economic principles in the agricultural industry.
07.02 Explain the importance of local, state, and federal regulations and required documentation affecting the agricultural industry.
07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation).
07.04 Select and use computer applications.
07.05 Analyze and interpret data.
07.06 Keep and maintain supervised agricultural experience (SAE) records.
07.07 Interpret legal descriptions of land.

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--The student will be able to:

08.01 Describe key factors in marketing agricultural products.
08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

09.01 Demonstrate acceptable work habits and attitudes.
09.02 Follow oral and written directions with understanding; ask questions that clarify directions, as needed.
09.03 Communicate effectively in verbal, written, and nonverbal modes; demonstrate effective telephone skills.
09.04 Recognize and demonstrate listening skills and assertive communications skills in the workplace.
09.05 Conduct small, informal, formal, and group meetings.

09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization.

Program: 8115110 Veterinary Assisting

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106210
Course Title: Veterinary and Animal Science 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of safety; animal behavior; animal welfare; animal control; and employability skills.

10.0 DESCRIBE ANIMAL SCIENCE AND THE ROLE OF ANIMALS IN SOCIETY--The student will be able to:

10.01 Describe animal science.
10.02 Describe the role of animals in society.
10.03 Locate and obtain informational materials on animal-related topics or issues.

11.0 IDENTIFY CAREERS IN THE ANIMAL INDUSTRY--The student will be able to:

11.01 Locate and obtain information on animal-industry careers and career opportunities.
11.02 Describe various careers in the animal industry.
11.03 Describe training requirements for entry and advancement in animal-industry careers.
11.04 Identify professional organizations and trade journals in the animal industry.

12.0 PRACTICE ANIMAL AND LABORATORY SAFETY-The student will be able to:

12.01 Practice safe procedures when working with animal-related equipment and in laboratory settings.
12.02 Practice safety precautions around animals.
12.03 Discuss the impact of unsafe procedures.
12.04 Define zoonosis.
12.05 Describe selected zoonotic diseases.
12.06 Discuss OHSA as it relates to the animal industry.

13.0 DEMONSTRATE BASIC FIRST AID FOR HUMANS--The student will be able to:

13.01 Locate and use a first aid kit.
13.02 Recognize allergic reactions.
13.03 Describe proper use of eye wash solution.
13.04 Control minor hemorrhage and/or trauma.
13.05 Practice emergency procedures.

14.0 IDENTIFY PARTS AND FUNCTIONS OF VARIOUS SYSTEMS OF SELECTED ANIMALS--The student will be able to:

14.01 Identify parts of the skeletal system of selected animals.

14.02 Compare human skeletal system to that of other animals.

14.03 Identify parts and functions of the following systems of selected animals:
- respiratory system
- urinary system
- digestive system
- cardiovascular system
- reproductive system
- nervous system

14.04 Employ correct terminologies for the variety of animal species and conditions within those species.

15.0 RECOGNIZE NORMAL AND ABNORMAL ANIMAL BEHAVIORS--The student will be able to:

15.01 Distinguish between instinctive and learned behaviors.
15.02 Recognize normal and abnormal behavioral characteristics of animals through observations.
15.03 Recognize signs of aggressive animal behaviors.
15.04 Identify behavioral problems.

20.0 DIFFERENTIATE BETWEEN ANIMAL WELFARE AND ANIMAL RIGHTS--The student will be able to:

20.01 Define animal welfare and animal rights.
20.02 Explain the differences between animal welfare and animal rights.
20.03 Identify animal welfare and animal rights advocate groups.
20.04 Debate current events concerning animal welfare and animal rights.
20.05 Describe animal cruelty and the consequences of cruel treatment of animals.

21.0 DEMONSTRATE KNOWLEDGE OF ANIMAL CONTROL AND HUMANE SOCIETIES--The student will be able to:

21.01 Differentiate between animal control agencies and humane societies.
21.02 Describe the responsibilities and goals of animal control agencies and humane societies.
21.03 Explain the laws governing each organization.
21.04 Identify and locate local animal control agencies and humane societies.

23.0 DEMONSTRATE EMPLOYABILITY AND INTERPERSONAL SKILLS--The student will be able to:

23.01 Demonstrate acceptable employee hygiene habits.
23.02 Demonstrate appropriate responses to criticisms from employer, supervisor, and peers.
23.03 Complete pertinent forms for employment, such as resume, job applications, W-4 forms.
23.04 Demonstrate job interview techniques.
23.05 Explain the Right-To-Know law.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8106220
Course Title: Veterinary and Animal Science 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of animal digestive systems; animal breeding; preventive medicine and disease control; control of parasites; animal marketing; and analyzing records.

16.0 IDENTIFY THE DIFFERENT DIGESTIVE SYSTEMS OF ANIMALS AND THE NUTRITIONAL REQUIREMENTS OF SELECTED SPECIES--The student will be able to:

16.01 Differentiate between ruminants and non-ruminants.
16.02 Differentiate between omnivorous, carnivores, and herbivores.
16.03 Describe the basic nutritional requirements of selected species.
16.04 Analyze different food labels.
16.05 Formulate animal food products.
16.06 Schedule feeding times for selected animals.

17.0 EXPLAIN THE REPRODUCTIVE SYSTEM AND BREEDING OF SELECTED ANIMALS--The student will be able to:

17.01 Describe the male and female reproductive systems.
17.02 Determine sex of animals.
17.03 Determine appropriate age for breeding.
17.04 Identify gestation length.
17.05 Describe estrous cycle.
17.06 Describe breeding techniques.
17.07 Select male and female for breeding.
17.08 Care of breeding stock.
17.09 Care of newborn.
17.10 Explain the differences and similarities between reproduction in animal species.

18.0 DEMONSTRATE KNOWLEDGE OF PREVENTIVE MEDICINE AND DISEASE CONTROL--The student will be able to:

18.01 Describe the importance of preventive medicine for animal health.
18.02 Recognize healthy animals.
18.03 Describe common diseases of animals.
18.04 Describe vaccinations available for disease prevention and vaccination procedures.
18.05 Evaluate and report health conditions of animals.
18.06 Collect urine and feces samples for analysis.
18.07 Describe the process for collecting blood samples for analysis.
18.08 Administer prescribed oral medications.
18.09 Describe the process for administering medications by injection.

18.10 Describe the procedure for safe disposal of medications.
18.11 Discuss the term immunology and active and passive immunity.
18.12 Describe procedures for periodic health check-up.

19.0 DESCRIBE INTERNAL AND EXTERNAL PARASITES AND CONTROL METHODS--The student will be able to:

19.01 Describe the internal and external parasites of selected animals.
19.02 Describe the methods of parasite prevention.
19.03 Describe the methods of parasite control.
19.04 Use a microscope for selected practices.
19.05 Describe the process for fecal sample collection, slide preparation, and examination.

22.0 DISCUSS ANIMAL MARKETING TECHNIQUES--The student will be able to:

22.01 Demonstrate procedures for preparing, maintaining, and exhibiting animals.
22.02 Collect and interpret market reports and identify market outlets for companion and food-producing animals.

24.0 MAINTAIN AND ANALYZE RECORDS--The student will be able to:

24.01 Maintain and analyze animal records.
24.02 Discuss the legal requirements of maintaining animal health records, and maintain and analyze animal health records.
24.03 Maintain and analyze basic business records (inventory, depreciation, receipts, expenses), using computer applications.
24.04 Maintain supervised agricultural experience (SAE) records.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8111520
Course Title: Veterinary Assisting 4
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of animal restraint and control; veterinary science terminologies; basic first aid; animal overpopulation and exotic animals.

25.0 RESTRAIN AND CONTROL ANIMALS--The student will be able to:

25.01 Describe behavioral changes due to aging.
25.02 Recognize signs of aggressive behaviors of companion animals.
25.03 Determine the appropriate restraining methods for specified behaviors.
25.04 Determine the level of restraint needed for the animal.
25.05 Verbally restrain animals.
25.06 Physically restrain animals.
25.07 Discuss chemical restraint of animals.
25.08 Describe complications encountered when restraining animals.

26.0 DEMONSTRATE PROPER USE OF VETERINARY SCIENCE TERMINOLOGIES--The student will be able to:

26.01 Define common veterinary terminologies.
26.02 Define common medical terminologies.
26.03 Apply prefixes and suffixes for veterinary medical terminologies.
26.04 Define gender and species-related terminologies.

27.0 DEMONSTRATE BASIC FIRST AID FOR COMPANION ANIMALS--The student will be able to:

27.01 Evaluate emergency health (physical and behavioral) status.
27.02 Restrain and move injured animals.
27.03 Demonstrate hemorrhage control.
27.04 Dress wounds and punctures.
27.05 Demonstrate the correct emergency procedures for shock, burns, heatstroke, and fractures.
27.06 Describe and access up-to-date information on animal health.
27.07 Demonstrate animal CPR.

28.0 IDENTIFY BREEDS IN EACH OF THE SEVERAL SPECIES OF COMPANION ANIMALS--The student will be able to:

28.01 Identify canine groups and breed characteristics.
28.02 Identify feline groups and breed characteristics.
28.03 Identify equine breeds and their primary use.

28.04 Identify breeds of rabbits and their primary use.
28.05 Identify avian species.
28.06 Write a physical description of any companion animal.

29.0 GROOM SELECTED COMPANION ANIMALS--The student will be able to:

29.01 Select, maintain, and demonstrate safe use of the grooming equipment.
29.02 Groom companion animals.
29.03 Clip animals.
29.04 Show and exhibit selected animals.
29.05 Read and interpret labels on grooming products.

30.0 DESCRIBE THE PROBLEMS, CAUSES, AND SOLUTIONS OF ANIMAL OVERPOPULATION--The student will be able to:

30.01 Explain the concept of overpopulation of companion animals.
30.02 Describe the causes of animal overpopulation and the problems it creates.
30.03 Define euthanasia and describe it's role in animal overpopulation.
30.04 Identify organizations involved in the public education of animal overpopulation.
30.05 Explain the pet owners' and society's responsibilities concerning animal overpopulation.

31.0 DESCRIBE EXOTIC ANIMALS AND THE EFFECTS OF DOMESTICATION ON THEM--The student will be able to:

31.01 Define exotic animal.
31.02 Identify exotic animals native to Florida.
31.03 Explain the effects of urbanization on the wildlife population.
31.04 Describe the roles of the Florida Game and Fresh Water Fish Commission in wildlife management.
31.05 Explain the effects of state, national, and international laws on the domestication of the exotic animals.
31.06 Distinguish which exotic animals can and which cannot be domesticated.
31.07 Debate consequences resulting from the domestication of exotic animals.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8111530
Course Title: Veterinary Assisting 5
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of human-animal bond; animal-related laws; animal research; genetics and biotechnology in reproduction; and enterprise management.

32.0 DISCUSS THE HUMAN-ANIMAL BOND AND IT'S EFFECTS ON HUMAN HEALTH--The student will be able to:

32.01 Explain the human-animal bond.
32.02 Discuss the positive health effects on people resulting from their interaction with animals.
32.03 Discuss programs which use human-animal interaction as a therapy tool.
32.04 Describe the characteristics of animals used in the animal-facilitated therapy programs.
32.05 Describe national and local programs which use animal-facilitated therapy.
32.06 Discuss grief response and emotional impact of animal loss.

33.0 LOCATE AND INTERPRET ANIMAL-RELATED LAWS--The student will be able to:

33.01 Describe local animal control laws.
33.02 Demonstrate knowledge of local and state animal regulations.
33.03 Determine the legal limitations of duties of an employee in the animal services industry.
33.04 Identify when an Animal Health Certificate is required.
33.05 Explain the laws governing the sale of animals and the disposal of animals.

34.0 EXPLAIN THE ROLE OF ANIMALS IN RESEARCH--The student will be able to:

34.01 Describe the history of the role of animals in research.
34.02 Discuss medical advances made possible through the use of animals in research.
34.03 Define USDA and explain it's roles in using animals for research.
34.04 Describe the role of the Institute of Animal Care and Use Committee (IACUC) with regard to animal research facilities.
34.05 Explain the controversy over using animals in research.
34.06 Identify organizations which are in favor of and those which are against the use of animals in research.
34.07 Develop a personal position on the use of animals in research and support that position.

35.0 DESCRIBE THE PRINCIPLES OF GENETICS AND BIOTECHNOLOGY IN REPRODUCTION--The student will be able to:

35.01 Define genetics and discuss genetic principles.
35.02 Explain biotechnology.
35.03 Discuss Mendelian genetics.
35.04 Develop a Mendel chart.
35.05 Define hereditary and environmental variation.
35.06 Explain the differences between purebreeding, inbreeding, linebreeding, outbreeding, selective breeding, linecrossing, and outcrossing.
35.07 Describe dominate and recessive genes.
35.08 Define and explain heritability estimates.

36.0 DEMONSTRATE KNOWLEDGE OF ENTERPRISE MANAGEMENT--The student will be able to:

36.01 Describe enterprise management.
36.02 Describe the economic principles that affect enterprise management.
36.03 Discuss the advantages and disadvantages of entrepreneurship.
36.04 Discuss common decision-making procedures in a particular animal-industry enterprise.
36.05 Investigate the economic and marketing aspects of kennels, catteries, paddocks, the rabbit industry, and exotic animal services.
36.06 Demonstrate proper sanitation techniques for a kennel, cattery, paddock, rabbitry, and zoo.
36.07 Describe methods of preventive medicine and quarantine for disease control in a kennel, cattery, paddock, rabbitry, and zoo.
36.08 Investigate the economic and marketing aspects in pet stores.

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Zoo Animal Technology
Occupational Area:	Agriculture
	PSV
CIP Number	0102.029900
Grade Level	College Credits
Length	AS Degree
Certification	

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to prepare students for employment as animal caretakers (79017502) veterinary laboratory technicians, (073.361-010), biological aides (049.384-010), animal breeders (410.161-010), game farm supervisors, (412.131-010), animal keepers, (412.137-010), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes, but is not limited to, instruction that prepares individuals to supervise and coordinate the activities of workers engaged in the care and exhibition of birds and animals. Subject matter also includes safety, diseases and parasites, feeding and nutrition, maintenance and repair, animal behavior, as well as leadership, communications, employability, human and public relations skills.

II. **LABORATORY ACTIVITIES**: Zoo and field laboratory activities are an integral part of this program including the safe use of mechanics' hand tools, field hand tools, carpentry hand and portable power tools, animal medical instruments and equipment, and animal restraint equipment.

III. **SPECIAL NOTE**: National Postsecondary Agricultural Student Organization is the appropriate vocational student organization for providing leadership training and for reinforcing specific vocational skills. Vocational Studen Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.64, FAC.

Planned and supervised occupational activities may be provided through directed laboratory experience, practicum or cooperative experience. Whenever the cooperative method of instruction is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; a work station which reflects equipment, skills and tasks which are relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The typical length of this program for the average achieving student is an associate degree. The standards credit hour length for this program is 66 hours.

IV. **INTENDED OUTCOMES**: After successfully completing this program, the student will be able to:

01.0 Prevent, treat and control diseases and parasites of animals.
02.0 Capture and restrain animals.
03.0 Manage animal housing and sanitation.
04.0 Manage animal nutrition and feeding.
05.0 Operate and maintain instruments and equipment.
06.0 Provide first aid for animals.
07.0 Collect laboratory specimens.
08.0 Analyze and keep records.
09.0 Manage animal, visitor and worker safety.
10.0 Identify animal species.
11.0 Interpret and observe laws, rules and regulations relative to operation.
12.0 Dispense medicine and supplies.
13.0 Manage, maintain and repair facilities.
14.0 Demonstrate leadership, employability, communication, human and public relations skills.
15.0 Observe and interpret animal behavior.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Zoo Animal Technology
Secondary Number:
Postsecondary Number: 0102.029900

01.0 PREVENT, TREAT AND CONTROL DISEASES AND PARASITES OF ANIMALS--The student will be able to:

01.01 Observe animals daily for symptoms of disease and parasites.
01.02 Recognize signs of disease requiring the quarantine or isolation of animals.
01.03 Vaccinate animals.
01.04 Provide special nutritional care for animals as required.
01.05 Maintain a quarantine program for new animal populations.
01.06 Manage a pest control program.
01.07 Identify and treat trauma, nutritional disorders, infections, poisoning and genetic diseases.
01.08 Properly handle mortality cases for disposal or necropsy.

02.0 CAPTURE AND RESTRAIN ANIMALS--The student will be able to:

02.01 Identify and use techniques and equipment for the capture and restraint of animals.
02.02 Identify circumstances justifying the capture and restraint of animals.
02.03 Transport animals safely.

03.0 MANAGE ANIMAL HOUSING AND SANITATION--The student will be able to:

03.01 Dispose of animal waste.
03.02 Identify specific sanitation procedures applicable to managing the collection.
03.03 Select and use appropriate cleaning aids and disinfectants.
03.04 Develop a sanitation schedule.
03.05 Assign animals to appropriate housing according to species requirements.
03.06 Maintain environmental conditions required by species.

04.0 MANAGE ANIMAL NUTRITION AND FEEDING--The student will be able to:

04.01 Identify nutritional requirements of various animal species in the wild.
04.02 Provide appropriate diets to maintain various species in captivity.
04.03 Properly store and maintain animal food supplies.
04.04 Prepare and dispense food.
04.05 Manage condition under which animals are fed.

05.0 OPERATE AND MAINTAIN INSTRUMENTS AND EQUIPMENT--The student will be able to:

05.01 Operate and maintain scales and balances.
05.02 Identify, operate and maintain clinical instruments.
05.03 Operate and maintain sterilization equipment.
05.04 Use and maintain capture and restraint equipment.
05.05 Operate communications equipment.
05.06 Identify and safely use hand and power tools.

06.0 PROVIDE FIRST AID FOR ANIMALS--The student will be able to:

06.01 Identify injuries requiring first aid and provide emergency treatment.
06.02 Prepare and maintain first aid equipment and supplies.
06.03 Identify injuries requiring services of a veterinarian.

07.0 COLLECT LABORATORY SPECIMENS--The student will be able to:

07.01 Collect blood specimens.
07.02 Collect urine specimens.
07.03 Collect fecal specimens.
07.04 Collect tissue samples.
07.05 Collect environmental samples.
07.06 Properly package and handle specimens for shipment or analysis.

08.0 ANALYZE AND KEEP RECORDS--The student will be able to:

08.01 Keep and maintain equipment service and maintenance records.
08.02 Keep personnel records.
08.03 Keep and maintain animal medical records.
08.04 Keep record of animal feeding and diet.
08.05 Maintain animal behavioral records.
08.06 Keep records of chemical, pesticide and medication use.

09.0 MANAGE ANIMAL, VISITOR AND WORKER SAFETY--The student will be able to:

09.01 Maintain the safety of animals.
09.02 Manage and maintain safety of visitors.
09.03 Handle animals in a safe and cautious manner.
09.04 Operate tools and equipment in a safe manner.
09.05 Prepare for emergencies.

10.0 IDENTIFY ANIMAL SPECIES--The student will be able to:

10.01 Classify animals according to habitat and nutritional requirements.
10.02 Recognize morphological characteristics of major animal groups.
10.03 Use taxonomical keys to identify animals to genus and species.
10.04 Identify species of animals in specific collections.

11.0 INTERPRET AND OBSERVE LAWS, RULES AND REGULATIONS RELATIVE TO OPERATION--The student will be able to:

11.01 Observe local, state, federal and international laws and regulations.
11.02 Maintain licenses, certificates, bonds and permits.

11.03 Interpret rules and regulations.
11.04 Identify agencies regulating the profession.

12.0 DISPENSE MEDICINE AND SUPPLIES--The student will be able to:

12.01 Follow verbal and written instructions when administering medications.
12.02 Interpret instructions and warnings on the labels of medicines and chemicals.
12.03 Maintain security of medicines and chemicals.
12.04 Identify medicines and chemicals commonly used in the profession.
12.05 Carefully mix, measure and dispense medications.
12.06 Maintain inventory of supplies and medications.

13.0 MANAGE, MAINTAIN AND REPAIR FACILITIES--The student will be able to:

13.01 Maintain grounds, facilities and exhibits according to master plan.
13.02 Operate grounds keeping equipment.
13.03 Form and pour concrete.
13.04 Perform simple electrical repairs.
13.05 Perform simple plumbing repairs.
13.06 Paint wood, metal and masonry surfaces.
13.07 Perform repairs on wooden structures.
13.08 Observe safety precautions.

14.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATION, HUMAN AND PUBLIC RELATIONS SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents that may be required when applying for a job.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

15.0 OBSERVE AND INTERPRET ANIMAL BEHAVIOR--The student will be able to:

15.01 Recognize animal breeding behavior.
15.02 Provide appropriate breeding environment for animals.
15.03 Adjust animal diet during breeding season.
15.04 Manage the breeding of various species.
15.05 Identify behavior of animals following parturition.
15.06 Provide pre-natal and post-partum care for animals.
15.07 Observe and recognize abnormal animal behavior.

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